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ORIGINAL ARTICLES

POSTCHOLECYSTECTOMY DYSKINESIA 425
Waltman Walters, M.D., Rochester, Minn.

BENIGN CONDITIONS SIMULATING BONE TUMORS 431
V. P. Collins, M.D., and L. C. Collins, M.D., Houston, Texas

LONG-TERM OUTLOOK FOR HEALED SUBACUTE BACTERIAL ENDOCARDITIS 437
C. E. Mendelson, M.D., Antonio Cahué, M.D., L. N. Katz, M.D., and W. A. Brams, M.D., Chicago

SOME ASPECTS OF OCCUPATIONAL DERMATOSES 442
J. V. Klauder, M.D., Philadelphia

TECHNIQUE FOR ROUTINE PELVIMETRY WITH USE OF A SINGLE X-RAY FILM 448
Herbert Thoms, M.D., and W. C. Billings, M.D., New Haven, Conn.

CURRENT CONCEPTS OF CHRONIC ATTIC AND MIDDLE EAR DISEASE 451
A. L. Juers, M.D., Louisville, Ky.

NEUROLOGICAL AND PSYCHIATRIC SIGNS ASSOCIATED WITH SYSTEMIC LUPUS ERYTHEMATOSUS 455
E. C. Clark, M.D., and A. A. Bailey, M.D., Rochester, Minn.

ACQUIRED TORTICOLLIS IN CHILDREN AND YOUNG ADULTS 458
J. S. Donaldson, M.D., Pittsburgh

CLINICAL NOTES

APLASTIC ANEMIA SECONDARY TO INTRAVENOUS THERAPY WITH RADIOGOLD 461
H. M. Schoolman, M.D., and S. O. Schwartz, M.D., Chicago

CHOLECYSTOGASTRIC FISTULA 463
J. L. Melamed, M.D., and M. L. Parker, M.D., Chicago

SUBCLINICAL POLIOMYELITIS IN A NEWBORN INFANT DUE TO INTRAUTERINE INFECTION 465
Alexis Shelokov, M.D., and Karl Habel, M.D., Bethesda, Md.

SPECIAL REPORTS

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES 467

EDITORIALS

Histaminic Cephalalgia 468
B. T. Horton, M.D.

Summary of Survey of Physicians' Attitudes Toward Voluntary Health Insurance 469

National Pulse Beat 470

ORGANIZATION SECTION

Public Opinion Survey About Doctors 471

REGULAR DEPARTMENTS

Bureau of Medical Economic Research: A Study of Medical School Alumni 473
Frank G. Dickinson, Ph.D., Chicago

Public Relations: Snowballing Social Security 485

Medical News 488

Correction 492

Meetings 492

Examinations and Licensure 493

Medical Division Report 494

Government Services: Navy. Veterans Administration. Selective Service. 495

Deaths 496

Foreign Letters:
Austria: Insulin Shock Treatment in Patient with Diabetes. Oral Therapy of Diabetes. Death of Professor Finsterer. 499
Denmark: Cortisone for Arthroses. Care of the Feeble-Minded. Consumption of Tobacco. 499
Norway: Mass BCG Vaccination. Seventy-Five-Year Jubilee of Journal. 500
Switzerland: Malaria Eradication in Southeastern Europe. Rabies Control. Review of Heart Operations. 500
United Kingdom: Annual Report of Ministry of Health. Symposium on Cancer. Daily Visiting in Children's Hospitals. Compensation for Hysteria. Primary Myxedema from Postpartum Shock. Ban on Heroin Lifted. Drip Indicator. Shortage of Private Beds. Dial "DOC." 501

Correspondence:
Foreign Medical Missions. Drugs and Electroconvulsive Therapy. Evaluating a Medicolegal Office. Discoveries by Medical Students. 503

Business Practice:
The Building 504

Medicolegal Abstract 506

Medical Literature Abstracts 507

Book Reviews 517

Queries and Minor Notes:
Anesthesia for Short Operations. Treatment of Typhoid Carrier. Treatment of Patient Having Tapeworm. Liver Function Tests. Masturbation. Poliomyelitis Among Pregnant Women. Pericardial Lymphatics. Uncontrollable Outbursts. Intestinal Diverticula. Relief of Pruritus. 518

WASHINGTON NEWS

Hearings on Social Security Act Amendments. Hearings on Dependent Medical Care Bill. President's Message on Health Program. Legislation and Personnel ..... Adv. Page 41

National Organizations of Medical Interest ..... Adv. Page 44

Tonics and Sedatives ..... Adv. Page 69

Index to Advertisers ..... Adv. Page 105

The Bright Side ..... Adv. Page 110

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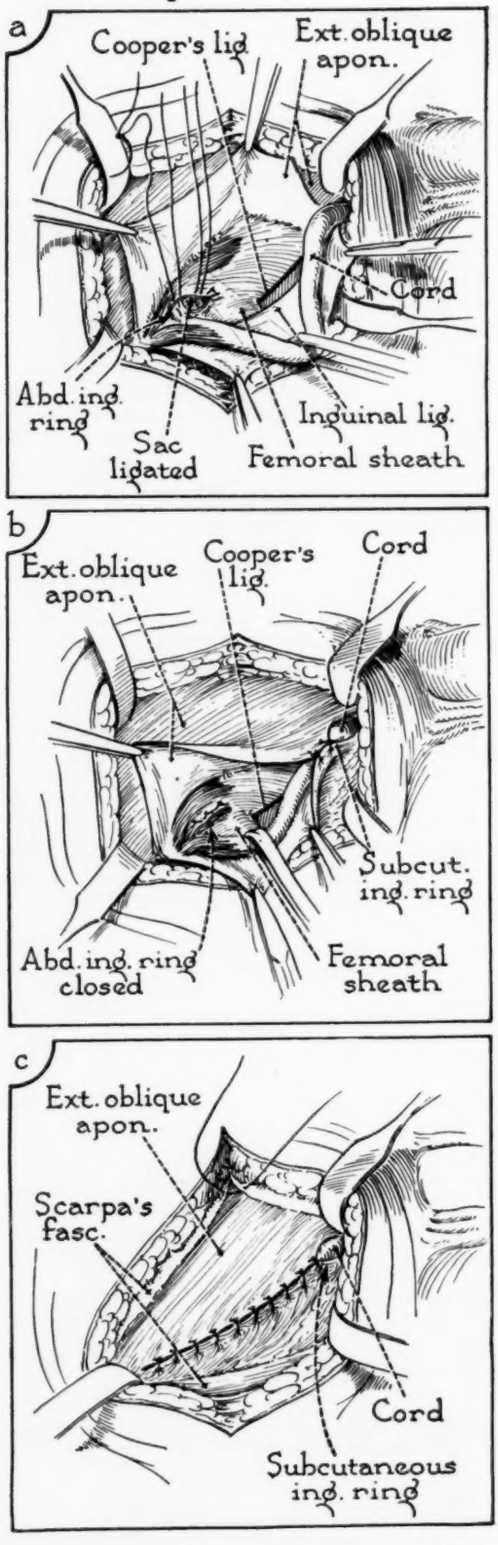

Hernioplasty for the small indirect inguinal hernia (viewed from right). a, b and c, Successive steps in the operation.

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POSTCHOLECYSTECTOMY DYSKINESIA

WITH PANCREATITIS, SPHINCTERITIS, AND CHOLEDOCHOLITHIASIS AS CAUSES

Waltman Walters, M.D., Rochester, Minn.

• *Pain recurring after cholecystectomy has occasionally been caused by stones that had been overlooked, by other residual conditions in the biliary tract, and by lesions in the duodenum or pancreas; it may also be caused by more remote abdominal or even retroperitoneal lesions. The diagnosis is especially difficult in the absence of jaundice. Cholangiograms after injection of sodium iodipamide are helpful in proving or disproving the patency of the extrahepatic bile passages and can be made at operation. In some cases of dysfunction of the sphincter of Oddi, sphincterotomy gives relief; in others, when there is evidence of inflammation in the head of the pancreas, choledochoduodenostomy is called for. When both operations fail, relief has been obtained by blocking or resecting the splanchnic nerves. In one case in which the abdomen, and especially the biliary tract, had been carefully explored and every effort had been made to attack the problem directly, a cervical chordotomy gave complete relief.*

The most frequent causes of pain recurring after cholecystectomy, especially if stones were present in the gallbladder, are (1) overlooked stones in the common duct; (2) stricture of the bile ducts; (3) a remnant of gallbladder with or without stones; (4) an elongated cystic duct that is inflamed or contains stones; (5) malfunction of the sphincter of Oddi; (6) pancreatitis; (7) intra-abdominal lesions, usually of an obstructive or perforative nature, such as duodenal ulcer, inflammatory lesion of the intestine, and intra-abdominal carcinoma; and (8) retroperitoneal lesions, involving such structures as the right kidney and the right adrenal gland and also including retroperitoneal lymphoma and sarcoma.

The preoperative differential diagnosis of these conditions may be impossible in spite of expert laboratory tests, including the use of x-ray diagnostic methods. The solution of the problem, as far as the diagnosis is concerned, usually will rest on information obtained at abdominal exploration. I have operated on patients who had lesions from each of the categories, and in many it was difficult to determine prior to operation whether the lesion was within the biliary tract or not.

Three groups of cases that are interesting examples come to mind: A few years ago, in a period of a week, I operated on three patients whose only symptoms were intermittent fever associated with pain in the right upper quadrant of the abdomen. One of them had four stones in the common and hepatic ducts; another a perinephritic abscess on the right; and the third a perforating neuroblastoma of the right adrenal gland with extension into the diaphragm and the inferior vena cava. The symptoms, physical findings, and laboratory data were similar in most respects in these three cases, although the patient with the right perinephritic abscess gave a history and had some signs indicating that a perinephritic abscess might be present. The second group was encountered a few weeks ago when, during the same week, I operated on three women whose conditions were diagnosed as postcholecystectomy syndrome. One had a dilated common duct of unknown cause; another had carcinoma of the right kidney; and a third had general carcinomatosis originating from a perforated papillary carcinoma of the ovary. Also, recently, my colleagues, Gray and Garrett,[1] described some cases of definite duodenal obstruction in which the symptoms simulated those of biliary disease.

Most of the lesions that I have mentioned as giving symptoms that simulate biliary dysfunction usually also have given some indication as to whether the lesion is more likely to be in or adjacent to the biliary tract. A carefully taken history and a carefully made physical examination with proper and indicated laboratory procedures and x-ray examinations usually would yield this information, but it is not always sufficiently definite so that an

From the Section of Surgery, Mayo Clinic and Mayo Foundation.
Read before the Section on Surgery, General and Abdominal, at the 104th Annual Meeting of the American Medical Association, Atlantic City, June 7, 1955.
The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.
Figure 1 is reprinted with permission from Parry and others.[4] Figure 2 is reprinted with permission from Kleitsch.[6]

1. Gray, H. K., and Garrett, C. M., Jr.: Obstruction of the Duodenum Beyond the Ampulla of Vater: A Possible Cause of Symptoms Suggesting Disease of the Biliary Tract, Ann. Surg. **142**: 532-536 (Sept.) 1955.

unequivocal diagnosis can be made before operation. The important points in differential diagnosis will not be discussed except to say that a patient who has had a diseased gallbladder, with gallstones removed because of biliary colics, usually is free of colics subsequently, unless other inflammatory or obstructive lesions are present in the biliary tract or in structures adjacent to it. These I enumerated in my opening paragraph. If, on the other hand, a patient with a history of pain suggesting cholecystitis continues to have similar pain after cholecystectomy at which gallstones were not found, the chances of a lesion in the common duct are not as great as they would be if gallstones had been present. Yet I have seen and removed remnants of a diseased gallbladder and cystic duct and stones from the common duct in some such cases and have excised localized strictures that partially obstructed the common duct. In this study, I wish to confine my remarks principally to those obscure conditions in and around the extrahepatic bile ducts that give pain and sometimes cause fever and jaundice.

PREOPERATIVE DIAGNOSIS

A history of pain in the right upper quadrant of the abdomen and jaundice that can be determined to be extrahepatic focalizes the lesion to an obstructive one of the biliary tract. The causes of these obstructive lesions are well known. It must be emphasized also that similar biliary lesions may not produce sufficient obstruction of the biliary tract to cause jaundice. Trueman and I [2] found many years ago, on study of patients with stones in the common duct, that about a third of them had not had jaundice and two-thirds of them had never had chills or fever. On the other hand, I have seen and operated on patients who had intermittent jaundice associated with pain in the right upper quadrant and whose biliary obstruction resulted from edema in the head of the pancreas, which caused narrowing of the pancreatic portion of the common duct. Also, on rare occasions, the obstruction was due to a perforating ulcer on the posterior wall of the duodenum.

OPERATIVE PROBLEM

Occurrence of Jaundice.—When the patient has jaundice associated with pain in the right upper quadrant, the problem at operation is to exclude the presence of stones within the common or hepatic ducts or the ampulla of Vater by opening the common duct, by carefully exploring the interior of the common and hepatic ducts with exploring scoops, by irrigation of the duct, and by passing scoops or probes through the ampulla of Vater into the duodenum. The duct should be palpated over the instrument, for sometimes scoops slip past an ampullar or a duct stone. Operative cholangiography may be used to supplement but not to replace this type of duct exploration. In the absence of stones in the duct and at the ampulla, the surgeon must be careful to exclude a small malignant lesion in or around the ampulla; he may open the duodenum to do so if necessary. The pancreas should receive careful attention. An enlarged head of the pancreas may be inflammatory and amenable to conservative treatment, or it may be malignant and require radical resection of the head of the pancreas, the duodenum, and lower portion of the common duct. In all such cases, there is little difficulty in making a correct diagnosis at operation and in selecting the proper surgical procedure.

Absence of Jaundice.—A history of upper abdominal pain, with the absence of a history of jaundice with or without definite colic in the right upper quadrant of the abdomen, makes the preoperative diagnosis more difficult. My major difficulty in such cases has been to determine, not only prior to operation but at operation, whether or not dysfunction of the sphincter of Oddi, pancreatitis, or a stone in the common duct that may have passed spontaneously into the duodenum has been responsible for the patient's attacks of pain and, if an ampullary stone has been present, whether the pain was due to obstruction of the biliary or pancreatic duct or both.

The introduction of the new radiopaque iodine preparation, sodium iodipamide (Cholografin), which may be injected intravenously, has proved helpful in many cases in determining before operation the presence of large stones in common and hepatic ducts. In other cases, such as reparative procedures for strictures of the common duct, roentgenologic examination after administration of sodium iodipamide has indicated the patency of the anastomosis and given a fairly accurate image of the size of the common and hepatic ducts, especially when the tomograph was used. However, because of the faintness of the image, errors may occur in some cases when small stones are present, especially if they are located in or near the ampulla. Last year the French surgeons, who at that time had had more experience than any others, stated that, in their experience, there was a 16% error in the proper interpretation of the images in the roentgenograms made after injection of sodium iodipamide (known in Europe as Biligrafin). It is too early to tell from our experience the percentage of error in the sodium iodipamide image. The roentgenogram made after injection of sodium iodipamide does not show negative shadows if stones or minor degrees of obstruction that could produce obstructive symptoms are present. This is important to remember, for, if the patient is having frequent attacks of upper abdominal pain, which are increasing in severity or in frequency or both, my decision has been to explore the structures within the abdomen, especially the upper part, and to open and explore the common duct even though the roentgenogram is not decisive. In some few cases of this type, cholangiograms made at operation have been helpful in proving or disproving the patency of the extrahepatic bile ducts.

CHRONIC PANCREATITIS

Chronic recurring pancreatitis, another cause of upper abdominal pain after cholecystectomy, is also difficult to diagnose prior to and at operation. Assuming that the preoperative roentgenologic examination of the pancreatic area reveals no areas of calcification (indicating recurring, intermittent episodes of inflammation and healing with deposition of calcium) and that the concentrations of serum amylase and serum lipase are normal, the

2. Trueman, K., cited by Walters, W.; Snell, A. M., and Clagett, O. T.: Surgery of the Biliary System, in Practice of Surgery, edited by D. Lewis, Hagerstown, Md., W. F. Prior Company, Inc., 1939, vol. 7, pp. 1-146.

diagnosis at operation is based on the findings made on palpation of the head and body of the pancreas. Inflammatory lesions of the pancreas, in my experience, may confine themselves to the head, which enlarges with a diffused brawny tumefaction. This condition is distinctly different from the usually localized, hard, irregular tumor that is carcinoma. Both lesions may partially obstruct the common duct and produce additional symptoms as a result. In only a few cases is it difficult to differentiate between the two on palpation. Another type of pancreatitis involves the entire pancreas. Frequently this follows an obstruction of the main pancreatic duct. The pancreas loses its normal form, shape, and consistency and, instead of being broad and flat and reasonably soft, becomes shortened, rounded, and indurated. The third type of pancreatic inflammation lies midway between these two. With it one notices some enlargement of the head of the pancreas, some rounding of the pancreas, and some shortening of its length; the lobules can be palpated more distinctly than they can normally, and they are sometimes said to feel "like the kernels of an ear of corn."

External or Internal Drainage of Bile.—When biliary obstruction due to inflammation of the pancreas was found at operation a few years ago, it was customary to employ prolonged external drainage of bile by means of a T tube. This prevented increased pressure in the bile ducts from forcing bile into the pancreatic duct and thus possibly prevented an increase of pressure in the pancreatic ducts. In addition, it allowed the associated cholangitis and choledochitis to subside. Later, internal drainage of bile by anastomosis between the common duct and duodenum was more frequently used if the common duct was dilated. My colleagues Comfort, Gambill, and Baggenstoss [3] a few years ago reported that, in 39% of the patients with pancreatitis that they studied, internal or external drainage of the biliary tract gave complete relief of symptoms for significant periods and in an additional 22% partial relief, in that symptoms were less severe or less frequent.

My colleagues Parry, Hallenbeck, and Grindlay [4] recently compared pressures within the pancreatic duct and the common bile duct in the laboratory animal (fig. 1). They used a new method of measuring such pressures without obstructing the ducts and without interference with the sphincteric mechanism of the duct. They found that the pressure in the pancreatic duct was two times greater than that in the common duct. After a meal, although both pressures increased, relative differences remained the same. They stated, "In two animals in which sphincterotomy of the bile and pancreatic ducts was performed, the fasting pressure was considerably lowered in the pancreatic duct and slightly lowered in the common bile duct; after feeding, however, the pressures reached the same level as in the animals with intact muscle."

Division of the Sphincter of Oddi.—In recent years at the Mayo Clinic we have employed, in addition, division of the sphincter of Oddi with inspection of the interior of the ampulla of Vater to determine whether the opening of the major pancreatic duct could be seen. If it can be seen, the duct is catheterized in order to determine, as suggested by Starr [5] of Australia, whether the main pancreatic duct is obstructed. Unfortunately, I have found it difficult in many cases to find the opening of the pancreatic duct in the ampulla even after an incision 1 cm. in length is made through the duodenal mucosa overlying the sphincter of Oddi, through the sphincter, and through the lower portion of the common duct. One of the reasons for this is explained in a recent study by Kleitsch [6] on the

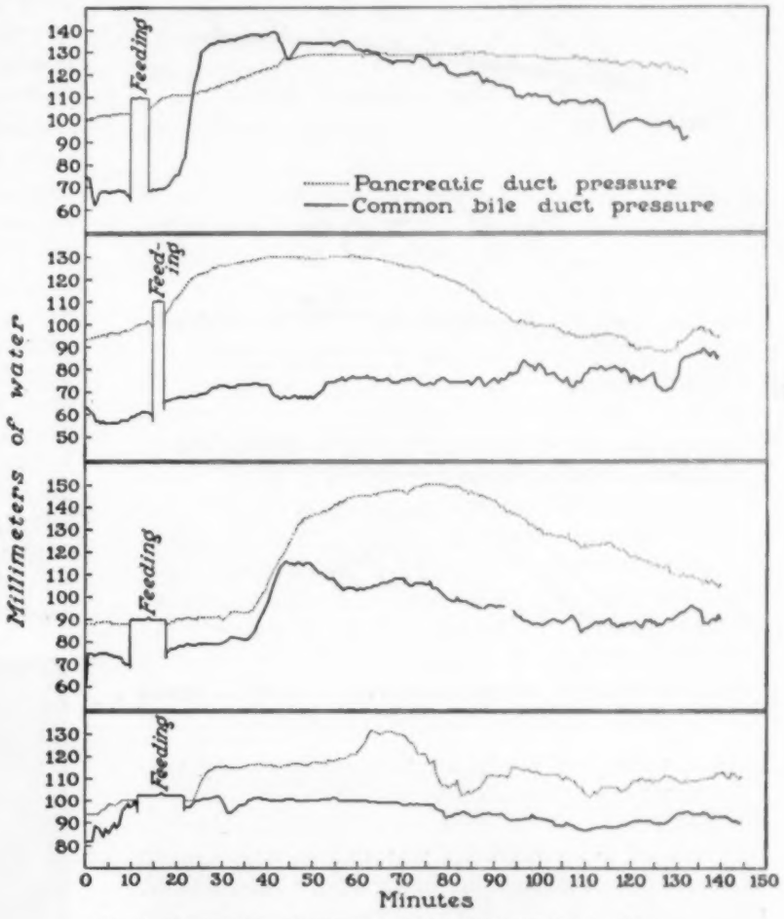

Fig. 1.—Comparison of pancreatic and biliary pressures in dogs.

anatomy of the pancreas with special reference to the duct system. He found in 33 cadavers that the main pancreatic duct has a separate ampulla at a distance from the ampulla of Vater in at least 10% of the cases and that in an additional 60% the main pancreatic duct has a large accessory duct that has a separate outlet in the duodenum. The size of this accessory duct is sufficient to prevent any

3. Comfort, M. W.; Gambill, E. E., and Baggenstoss, A. H.: Chronic Relapsing Pancreatitis: Study of 29 Cases Without Associated Disease of the Biliary or Gastro-Intestinal Tract, Gastroenterology **6**: 239-285 (April) 1946; **6**: 376-408 (May) 1946.

4. Parry, E. W.; Hallenbeck, G. A., and Grindlay, J. H.: Pressures in the Pancreatic and Common Ducts: Values During Fasting, After Various Meals, and After Sphincterotomy: An Experimental Study, A. M. A. Arch. Surg. **70**: 757-765 (May) 1955.

5. Starr, K. W.: Obstructive and Pancreatic Problems Following Choledochotomy, editorial, A. M. A. Arch. Surg. **66**: 398-399 (April) 1953.

6. Kleitsch, W. P.: Anatomy of the Pancreas: A Study with Special Reference to the Duct System, A. M. A. Arch. Surg. **71**: 795-802 (Dec.) 1955.

increase in pressure within the main pancreatic duct, even though the opening of the main pancreatic duct in the ampulla of Vater is obstructed (fig. 2). In other cases, I have found a flap of ductal mucous membrane over the opening of the pancreatic duct. With an increase in pressure in the bile duct, this flap presses against the opening of the pancreatic duct and so shuts it off. It probably also prevents bile from entering the ampulla.

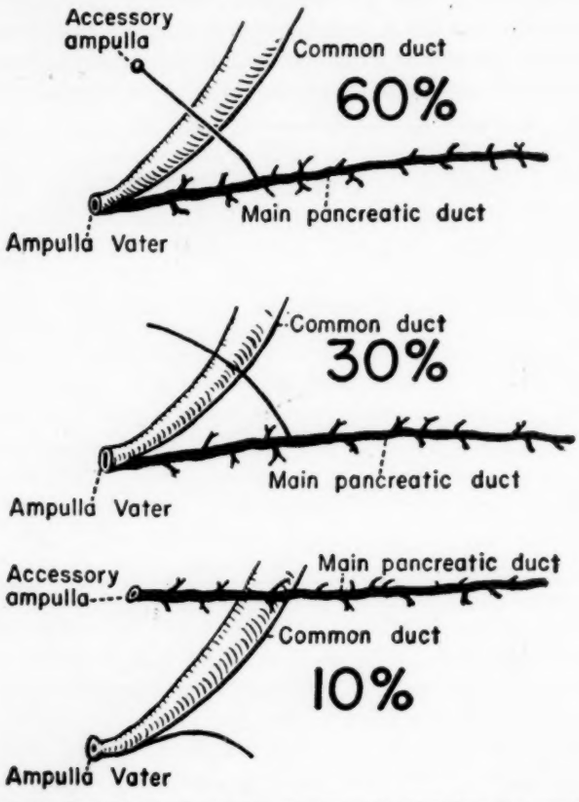

Fig. 2.—Percentages of entrance of pancreatic ducts into the ampulla of Vater and the duodenum.

In a recent case in which I removed, by multiple incisions, six calcium carbonate stones (8 to 10 mm. in diameter) from dilated branches of pancreatic ducts in the head of the pancreas, I was able to pass a small ureteral catheter through one of the dilated ducts into the opening of the main pancreatic duct in the ampulla. I had been unable to identify this opening after the sphincterotomy because of this overlying flap. A ureteral catheter was then passed from below through the opening in the ampulla into the main pancreatic duct; the site was demonstrated roentgenologically (fig. 3). One end of the catheter was left in the pancreatic duct for drainage, and the other was brought out of the abdomen through the duodenum. A long Cattell type of T tube was used to drain the common duct; the distal portion was passed into the duodenum through the divided sphincter of Oddi. The management in this case is an example of a method that can be used to relieve the intraductal biliary and pancreatic pressures. (The patient has been freed of his continuous and associated colicky pain present almost constantly before operation. The drainage tubes in his ducts are still in place, but it is only a month since his operation.) My colleagues Berens, Baggenstoss, and Gray[7] in a study of the pancreas at autopsy in 16 cases of pancreatitis, discovered that the main pancreatic duct (Wirsung) was grossly dilated in the tail of the pancreas in seven cases, and they observed histological evidence of dilatation in the smaller ducts and ductules in four other cases. Factors contributing to dilatation of the main duct were pancreatic lithiasis in two cases, choledocholithiasis in two cases, and foci of necrosis and inflammation in three cases. They advised surgical treatment of retrograde decompression of the pancreatic duct by amputation of the tail of the pancreas with pancreaticojejunostomy. Gray and, later, others have carried out this procedure in one case each, with almost immediate and complete healing of a chronic pancreatic fistula persisting after drainage of a pancreatic cyst.

Sphincterotomy.—In cases of dysfunction of the sphincter of Oddi with and without associated chronic pancreatitis when the common duct is not dilated, I have performed sphincterotomy. On the other hand, in some cases in which the head of the pancreas was inflamed and enlarged, I have demonstrated roentgenologically narrowing of the pancreatic portion of the common duct. In such cases sphincterotomy would probably not give the complete relief of symptoms that choledochoduodenostomy would. When the duct is dilated, I perform choledochoduodenostomy and, when it is not, sphincterotomy. In some cases, I have performed both operations, one after the other, when the patient's attacks of pain continued, and, in some cases, I have performed both procedures simultaneously. In a few cases, in which these procedures have failed to relieve the attacks of pain, relief has been accomplished by splanchnic nerve blocks, first with procaine hydrochloride, followed by injections of a small amount of alcohol if the procaine injection was successful. Relief of pain in some of these cases lasted four to five months, and, when the alcohol injection was repeated, relief was again obtained for a similar period. If the first injection was successful, my neurosurgical colleagues have resected the splanchnic nerves in a few cases, but even then sometimes some pain has recurred.

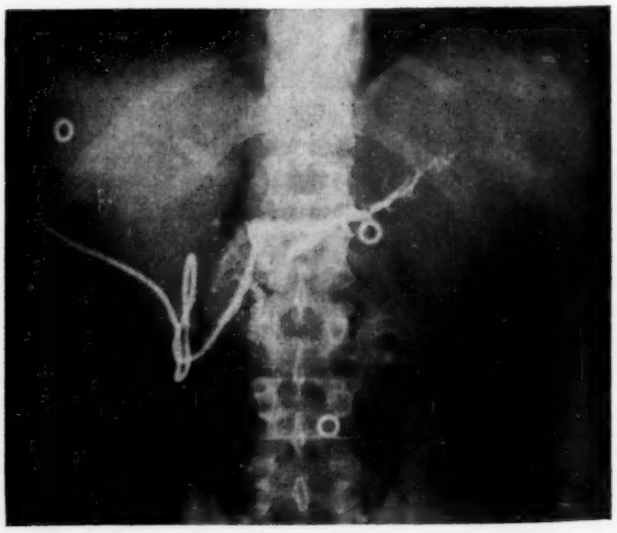

Fig. 3.—Pancreatic duct after removal of pancreatic stones.

7. Berens, J. J.; Baggenstoss, A. H., and Gray, H. K.: Ductal Changes in Chronic Pancreatitis, A. M. A. Arch. Surg. 68: 723-733 (June) 1954.

In my opinion, these neurosurgical procedures should not be used except in cases in which the abdomen and the biliary tract have been explored and every effort has been made to attack the problem directly by external drainage of the common duct with a T tube or by internal drainage by means of biliary-intestinal anastomosis, by sphincterotomy, or by both.

In one patient, in whom none of these procedures (splanchnicectomy was not done) produced relief of symptoms, one of my colleagues in neurological surgery, H. J. Svien, did a cervical chordotomy with complete relief of symptoms. This was a drastic procedure, which was undertaken only after the most careful consideration of all aspects of the patient's clinical course, symptoms, and treatment and of her personality and mental and physical stability. Happily, chordotomy has completely relieved the attacks of pain and no unwanted symptoms have developed. Mention is made of this case to show to what extremes the patient and the surgeon are willing to go in some cases to secure relief of symptoms of pain.

TABLE 1.—*Stones at Cholecystectomy in Ten Patients* *

Years Between Cholecystectomy and Sphincterotomy	Patients	Stones †		Operations in Interval
		No	Yes	
0-5	3	2	1	.....
6-10	2	..	1	3 in 1 case
11-15	3	2	1	0 in 1 case 2 in 2 cases
16-20	1	Not stated		.....
25-30	1	Not stated		.....

* Follow-up after sphincterotomy ranged from five months to two years and five months.
† At time of cholecystectomy.

SPHINCTEROTOMY AND T-TUBE DRAINAGE

In some cases in which sphincterotomy has been performed, I have used a short T tube in order to study intraductal pressures subsequent to the operation. I have used it in too few cases of this type and made too few studies at this time to come to any definite decision referable to the duration of the effects of sphincterotomy on intraductal biliary pressure and the relation of the lack of pressure within the common bile duct, if it persists, to the patient's pain. In a recent case, however, a cholangiogram, made by injecting radiopaque material through the T tube nine weeks after sphincterotomy, was followed by spasm of the lower end of the common duct and severe pain (fig. 4*A*). The pain was relieved by glyceryl trinitrate. A delayed cholangiogram some minutes later showed that the spasm was still present with retention of the radiopaque dye within the bile ducts (fig. 4*B*). Yet, duodenal contents could be aspirated from the T tube, and there was no intraductal pressure. In another patient operated on previously, narrowing of the pancreatic portion of the duct was demonstrated with similar retention of radiopaque dye within the extrahepatic ducts, as though sphincterotomy had not been done.

As time passes and more sphincterotomies are performed, I believe that there probably will be less need to use the long T tube extending through the divided sphincter. This is especially likely if the operation is performed accurately, if the incision through the sphincter and through the duodenal mucosa over it is made sufficiently long so that the interior of the ampulla can be seen, and if the cut edge of the duodenal wall is accurately sutured to the edge of the divided ampullar portion of the common duct. This suturing prevents any possibility of hemorrhage from the operative site, and the use of a long-ended, splinting T tube should not be necessary to prevent contracture of a smaller and less accurately made incision in the sphincter. Under these circumstances, better studies of the physiology of the biliary tree after sphincterotomy can be carried out. I suspect that ductal spasm will occur and will cause pain in other cases after sphincterotomy. In still other cases, persistent narrowing of the pancreatic portion of the common duct, with resultant biliary stasis and infection of bile ducts and probably the pancreas, will continue to cause intermittent pain. In the latter type of case, biliary-intestinal anastomosis may solve the problem, while, in cases of ductal spasm, a neurological attack by splanchnic nerve blocks, splanchnicectomy, or even chordotomy may be necessary if sphincterotomy fails.

T-tube drainage of the common duct has several advantages in cases of pain in the right upper quadrant of obscure cause when pancreatitis is suspected but is difficult to prove. (In practically all cases in which biliary obstruction is present, cholangitis occurs and the bile becomes infected with gram-negative bacilli and with cocci.) It is especially helpful in the determination of the role that the sphincter of Oddi may be playing, if any. It relieves the biliary obstruction or stasis and thus allows the cholangitis and the active pancreatitis to subside. If the patient is free of pain with the T tube open but has pain when it is closed, this is definite clinical evidence of biliary obstruction. If attacks of pain have been relieved by T-tube drainage but have recurred after the T tube has been removed and the incision has healed, this too provides clinical evidence that increased intraductal pressure is responsible for the patient's pain. Such histories are indication for the performance of a sphincterotomy or choledochoduodenostomy or both. It must not be forgotten, however, that such prolonged T-tube drainage of the common bile duct completely relieves the patient's symptoms in many cases. Gambill and associates have shown that this is probably due to subsidence of the infection in the biliary tract and of the pancreatitis, both of which are an important part of the biliary obstruction.

Fig. 4.—*A*, postoperative cholangiogram nine weeks after sphincterotomy; *B*, delayed cholangiogram after glyceryl trinitrate.

RECENT CASES

I have reviewed 19 cases of postcholecystectomy dyskinesia in which sphincterotomy or choledochoduodenostomy was carried out. These operations were performed too recently to permit any very definite conclusions about the procedures. In cases 1 to 15 sphincterotomy was performed; in cases 17 to 20, choledochoduodenostomy. Case 16 is included for purposes of comparison. Pertinent data are presented in tables 1 to 5.

TABLE 2.—*Operations After Cholecystectomy in Ten Patients* *

Operations †	Cases
Between cholecystectomy and sphincterotomy	
Remnant of gallbladder removed	
With vagus nerves cut	1
With removal of cystic duct and lysis of adhesions	1
Negative exploration (elsewhere); exploratory choledochostomy and T tube; choledochoduodenostomy (3 operations)	1
Sphincterotomy alone	4
Plus choledochoduodenostomy	2
Plus diverticulectomy in ileum	1
Plus removal of cystic duct stump	2
Plus exploration of previous occluded choledochoduodenostomy	1
After sphincterotomy	
Right splanchnic block in 10 mo.	1
Exploratory choledochostomy; exploration of old choledochoduodenostomy and of old transduodenal sphincterotomy	1

* Follow-up after sphincterotomy ranged from five months to two years and five months.

† For results see table 3.

SUMMARY AND CONCLUSIONS

Recurring attacks of upper abdominal pain after cholecystectomy may be caused by many conditions. Even after carefully elicited history, physical examination, and judicious use of laboratory procedures, including x-ray examinations after injection of sodium iodipamide (Cholografin), it still may be difficult to localize the lesion definitely to the biliary tract, and abdominal exploration will be required. This should involve exploration not merely of the interior of the common and hepatic ducts but of the pancreas, duodenum, and the sphincter of Oddi, as well as the gastrointestinal tract and retroperitoneal region.

Jaundice accompanying attacks of pain simplifies the problem, because it localizes the lesion to the liver, biliary passages, and pancreatic areas. The patient who does not have jaundice and does not have a stone or stones in the common or hepatic duct when the duct is opened and explored presents a particularly difficult diagnostic problem. It is difficult to determine whether there is dysfunction of the sphincter of Oddi with or without pancreatitis, whether there is cholangitis or pancreatitis alone, and what the reciprocal relation is, if any, between the two. In these cases, sphincterotomy or choledochoduodenostomy or both have been performed with varying degrees of success. In some cases, a single one of these operative procedures has been successful. In other cases, neither procedure, performed at separate operations or at the same operation, has been completely successful. Although in some cases complete relief has been obtained, in many cases the relief has been partial, consisting of less pain and less frequency. Decision as to which procedure to perform, in my opinion, rests on whether there is enlargement of the head of the pancreas

TABLE 3.—*Results of Sphincterotomy in Ten Cases* *

Case	Interval, Yr., Between Sphincterotomy and Previous Cholecystectomy	Interval, Yr., Between Sphincterotomy and Follow-Up	Results †
1	18	1⅞	Attacks same ‡
2	14	2⅝12	Attacks less frequent
3	11 mo.	1⅝12	Complete relief
4 §	14	1¼	Better; gained weight
5	10	2	Attacks less painful and severe
6	1	5 mo.	Health better; gained 35 lb.
7	4	1	Pain continued; chronic pancreatitis. Right splanchnic block 8 mo. after sphincterotomy. Now has pain controlled by chlorpromazine (Thorazine)
8 §	12	1½	Complete relief 1 yr.; recent letter states 4 or 5 attacks in interval
9 §	7	8	Fairly well; gained 10 lb.; occasional chills, fever, pain
10	26	1½	Further attacks‡; choledochostomy 1½ yr. later. T tube just removed, fairly well

* Follow-up ranged from five months to two years and five months.

† Questionnaire March 29, 1955, or letter within six months of that date.

‡ Choledochoduodenostomy at time of sphincterotomy.

§ Additional operations in interval between cholecystectomy and sphincterotomy.

TABLE 4.—*Results of Sphincterotomy in Five Recent Cases and Results of Choledochostomy in One Case* *

Case and Yr.†	Operations After Cholecystectomy: Date	Operations	Result
11 1951	4/20/53	Cystic duct stump excised; T tube	No relief of pain
	3/10 and 8/11/54	Right splanchnic blocks (alcohol)	Relief of pain 5 mo. from both
	3/30/55	Sphincterotomy	T tube in place
12 1940	2/1951	Exploratory choledochostomy (elsewhere); no stones	Well 7 mo.
	6/ 4/52	Exploratory choledochostomy; T tube in 4 mo.	Intermittent pain when T tube removed
	1/17/55	Choledochoduodenostomy (Mayo-Sullivan tube); sphincterotomy	Doing well; drainage
13 1950	6/ 1/46	Exploration (elsewhere) for gallstones (hemorrhage at operation)	
	6/20/46	Marsupialization of pancreatic cysts; catheter drainage	Dull feeling in 2 mo.; pain recurred in 5 mo.
	11/1946	Drainage of cyst and insertion of catheter (elsewhere)	
	3/ 1/50	Cholecystectomy; choledocholithotomy; choledochostomy; repair of hernia	T tube; fairly well 3 yr., then pain
	3/14/55	Sphincterotomy; T tube	
14 1946	5/16/49	Negative exploration of common and hepatic ducts; T-tube drainage	Better 1 yr.; recurrent attacks in 3 yr.; more frequent later
	3/21/55	Sphincterotomy; pancreatic duct catheterized; T tube in common duct	
15 1939	11/19/52	Choledochoduodenostomy	Well 3 mo.; then nausea and vomiting; pain later
	8/20/53	Splanchnic nerve block (elsewhere)	Vomiting continued; no pain except in attacks for a time; 15 mo. later constant pain
	1/25/55	Exploratory choledochostomy; sphincterotomy; T tube	4 or 5 attacks of pain and fever; T-tube drainage
16 1950	2/21/51	Stump of cystic duct excised; exploratory choledochostomy	Excellent

* Interval since sphincterotomy, up to two and one-half months.

† Year of cholecystectomy.

from inflammation, narrowing of the pancreatic portion of the common bile duct with biliary stasis, or dilatation of the common duct.

In cases of recurrent pain after cholecystectomy, for many years I performed external drainage of the common duct with the T tube kept in for a prolonged period. In recent years, I have used more internal drainage by anastomosing an opening in the common duct to an opening in the duodenum. When the common duct is small and there is uncertainty as to whether the lesion is pancreatitis or dysfunction of the sphincter of Oddi, transduodenal sphincterotomy has been performed. In these cases, every effort has been made to find the opening of the main pancreatic duct in the ampulla. In some cases, it has been found and catheterized. In some, narrowing could be noted in the part of the duct not too far distant from its opening in the ampulla. In others there has been no apparent obstruction. Kleitsch [6] demonstrated in 10% of cases that the main pancreatic duct does not enter the ampulla but has a separate opening in the posterior wall of the duodenum proximal to the papilla of Vater and in 60% of cases that the accessory pancreatic duct effectively draining the pancreas has a separate opening in the duodenum. In some cases in which prolonged T-tube drainage, choledochoduodenostomy, and sphincterotomy have not relieved the patient's pain, benefit has been obtained by splanchnic nerve blocks with alcohol or by splanchnicectomy, and, in one case, the attacks of pain were so severe that cervical chordotomy was done with complete relief.

TABLE 5.—*Results of Choledochoduodenostomy in Four Cases* *

Case and Yr.†	Operations: Date	Operations: Type	Result
17 1951	6/12/53	Choledochoduodenostomy; excision of stump of cystic duct; no stones	No improvement to 1955; some since
18 1934	4/14/50	Exploratory choledochostomy; remnant of cystic duct removed	3/30/55: not too well
	3/28/52	Choledochoduodenostomy	
19 1934	2/ 5/44	Exploratory choledochostomy; no stones	Relieved 1 yr.; then pain, colic, nausea and vomiting, no jaundice
	2/ 6/53	Choledochoduodenostomy	Relieved 3 mo.; then symptoms
	7/29/53 8/ 1/53	Right splanchnic block Right splanchnicectomy	Temporary relief
	12/ 1/54	Cervical laminectomy; left spinothalamic chordotomy, cervical	Complete relief. 3/9/55: no pain; feeling fine
20	3/15/38	Exploratory choledochostomy; dilation of ampulla; T tube	Free of abdominal pain until May, 1953; one attack March, 1955; otherwise well
	5/18/53	Choledochoduodenostomy	

* Follow-up ranged from one and three-fourths to three years.
† Year of cholecystectomy.

The most important deduction to be made, as said before, is that abdominal exploration frequently is necessary to determine the presence of a lesion in the biliary tract subsequent to cholecystectomy, and this in spite of a carefully taken history and laboratory and x-ray studies. Although relief of increased pressure in the bile ducts and the associated biliary and pancreatic infection, by prolonged drainage of bile from the common duct through external drainage with a T tube or by internal drainage through choledochoduodenostomy or choledochoenterostomy or by sphincterotomy, may stop attacks of pain in most patients with these conditions, some patients will not obtain relief. Until the underlying cause of pain is ascertained in these exceptional cases, a neurological approach, removing the splanchnic nerve component by alcohol injection or even by chordotomy, may be necessary as a temporary and possibly a permanent solution.

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BENIGN CONDITIONS SIMULATING BONE TUMORS

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• *Seven cases are presented to illustrate the importance of recognizing benign lesions or normal conditions that may give the appearance of malignant bone tumors. Any single lesion should be studied from more than one angle, and the roentgen appearance should be watched over an interval of time. Examination of the entire skeleton is necessary for exact diagnosis.*

In five cases the conditions were found to be either normal or self-limited, so that no operation was required. A sixth case concerned a lymphoblastoma that regressed almost completely after radiotherapy and nitrogen mustard administration; the seventh was a giant-cell tumor successfully treated by amputation. A systematic approach to differential diagnosis gives the patient the advantage of conservative treatment and spares him mental trauma.

Malignant bone tumors hold a special interest because they occur most often in young adults and because the prognosis is uniformly ominous. At best the favorable lesion will be treated by amputation of a limb; at worst radiation may fail to influence in any way the relentless course of radio-resistant tumor. The incidence of these lesions is not high; it is given as 0.5%.[1] The variety of primary malignant bone tumors is not great. The principal examples are osteosarcoma, chondrosarcoma, Ewing's sarcoma, reticulum-cell sarcoma, myeloma, and periosteal fibrosarcoma. For all these the five-year survival rates are about 5%.[1] The discovery of a probable

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1. Steiner, P. E.: Evalation of the Cancer Problem, Cancer Res. 12: 455-464, 1952.

metastasis in bone places the patient in the inoperable group, however favorable the primary lesion may be. It has been stated that the best chance for cure of cancer lies in the possibility of a mistaken diagnosis. There are many radiological and some histological appearances of bone that, in varying degree, simulate malignant neoplasm. While every effort is made to recognize malignant bone lesions at the earliest possible moment, it is at least equally important to recognize benign lesions as such and to avoid, if possible, the mental trauma to the patient of protracted cancer investigations or the disaster of unnecessary radical treatment.

Occasionally authoritative opinion, both radiological and pathological, may be divided, and a decision may be necessary, based on a consensus or on calculated risk. Sometimes radiological or pathological features alone are inadequate, but if these are taken together, along with clinical data, the diagnosis may be established beyond reasonable doubt. Regrettable errors may occur when a benign lesion effectively masquerades as malignant because of atypical appearance or history, incomplete data, precipitate diagnosis, or simple failure to have considered commonplace lesions as an alternate to foregone conclusions. An orderly approach to differential diagnosis is the best safeguard against diagnostic error through failure to have considered all possibilities. The seven categories into which benign conditions of bone may be divided are discussed below.

VARIATIONS OF NORMAL ROENTGEN APPEARANCES

Normal Structure.—Seen in unfamiliar projection, rotation or foreshortening of a part may strongly suggest pathology. Common examples are the appearances of the deltoid tubercle of the humerus, the radial tuberosity, and the lesser trochanter of the femur, which seen en face through the shaft of the bone, may be taken for an intramedullary expanding lesion. A comparison of paired parts as a standard procedure, or confirmation by repeat examination, will readily establish the normality of such findings. The linea aspera of the femur and the attachment of interosseous membranes on the tibia and fibula or radius and ulna may simulate periosteal new bone formation.

"Roughening" or "Abrasion" of Posterior Aspect of Lower End of Femur.— The descriptive term "roughening" or "abrasion" of the posterior aspect of the lower end of the femur [2] has been applied to a variation of normal contour. The following case is an example of how unfamiliar appearance leads to apprehension and consideration of malignant bone tumor.

CASE 1.—An 11½-year-old girl suffered a minor injury to her right knee followed by some soreness that subsided after a few days. About four months later she complained of pain in the same knee. The roentgenographic appearance of the posterior aspect of the distal portion of the femoral shaft led to a diagnosis of epiphysitis by the orthopedist, who applied a cast for four weeks. When this was removed further consultation was sought, and the possibility of bone tumor was considered. Biopsy was carried out, and only benign fibrous tissue was encountered. Some 10 months later the left knee was injured in a fall from a horse, and x-ray studies showed a similar appearance in the lower end of the left femur. There has been no further sign or symptom related to either knee.

Double Cortical Contour.—Double cortical contour may be observed in the long bones of infants between 4 and 8 months of age. It is strongly suggestive of the periosteal reaction produced by neoplastic, inflammatory, or infectious disease. The explanation for this finding is not certain; it may be a matter of projection of the shaft of bone that is not smoothly rounded in cross section [3]; it may be a physiological response of periosteum to the minimal flexing of long bones that occurs with handling.

DEVELOPMENTAL ABNORMALITIES

The category of developmental abnormalities includes a group of non-neoplastic lesions associated with growth and development of bone.

Cortical Defects.—As the name cortical defect implies, this lesion appears as a defect in the cortex of long bones. The incidence is given as 53% for boys and 22% for girls.[2] Lesions may be multiple; they occur in any long bone in the proximal or distal thirds but never in the middle third, and the distal end of the femur is the commonest site. The margins are more or less sharply defined; they may be smooth or scalloped; the defect may appear loculated due to coalescence of small areas or persistence of trabeculae of bone. Cortical defects migrate away from the epiphyseal line as the bone grows and gradually disappear spontaneously, apparently by sclerosis.

CASE 2.—An 18-year-old girl gave a three-year history of rather vague aching in both knees, aggravated by weight-bearing and hyperflexion. In the beginning she had had a bout of low-grade fever, and a diagnosis of brucellosis had been proposed but not substantiated. Symptoms led to x-ray examination of knees and the discovery of the lesion shown in figure 1. A diagnosis of giant-cell tumor was made, and she was referred for confirmation and treatment. At this time a radiological diagnosis of cortical defect was made. Biopsy was not deemed a justifiable procedure on the evidence available. This case is presented without histological evidence to emphasize that when the diagnosis of a benign lesion can be made, the patient may be spared discomfort and expense. A follow-up report at six months showed that symptoms had subsided and there was no change in the cortical defect.

Nonosteogenic Fibroma.—Radiologically nonosteogenic fibroma is a medullary lesion, sharply defined, lobulated, and trabeculated, which may expand the shaft of the involved bone.[4] The histological features are cellular fibrous tissue, giant cells, some blood pigment, and a varying component of foam cells or lipid-containing macrophages. It is possible or likely that this lesion is a more advanced manifestation of the same process as produced the cortical defect. There are several other pathological diagnoses having similar radiological and histological appearances. These are nonossifying fibroma, parosteal fibroma, subperiosteal fibroma, subperiosteal giant-cell tumor, and solitary xanthoma of bone. Whether or not these are identical or related lesions, they have in common a benign nature and a radiological appearance that raises the suspicion of malignant bone tumor. In at least one reported instance amputation was carried out before the benign nature was recognized.[5]

Bone Cyst.—Circumscribed, well-demarcated lesions may be described radiologically as cystic or cyst-like, but

2. Caffey, J.: On Fibrous Defects in Cortical Walls of Growing Tubular Bones, in Advances in Pediatrics, vol. 7, edited by S. Z. Levine, Chicago, Year Book Publishers, Inc., 1955, pp. 13-51.
3. Glaser, K.: Double Contour, Cupping and Spurring in Roentgenograms of Long Bones in Infants, Am. J. Roentgenol. **61**: 482-492, 1949.
4. Jaffe, H. D., and Lichtenstein, L.: Non-Osteogenic Fibroma of Bone, Am. J. Path. **18**: 205-211, 1942.
5. Kimmelsteil, P., and Rapp, I. H.: Cortical Defect Due to Periosteal Desmoids, Bull. Hosp. Joint Dis. **12**: 286-297, 1951.

a defect filled with fluid or semisolid material cannot be differentiated from one composed of cartilage or soft tissue. Bone cysts, sometimes called aneurysmal or solitary, may very closely resemble larger cortical defects or nonosteogenic fibromas. Their origin is uncertain, but they may be the result of trauma, infarct, or degeneration of some local lesion.

Fibrous Dysplasia.—Fibrous dysplasia is a familiar lesion to radiologists and pathologists, but in the monostotic form its nature cannot be established from roentgen appearance alone, and it may be necessary to rule out a local destructive lesion by biopsy.

Osteochondrosis, Osteochondritis, or Aseptic Necrosis.—The terms osteochondrosis, osteochondritis, and aseptic necrosis have been used to describe a process of undetermined pathogenesis involving centers of ossification. It is considered that trauma and ischemic necrosis play some part in producing the lesions, but this is not a completely adequate explanation. In the common sites of femoral head (Legg-Calvé-Perthes disease), tibial tubercle (Osgood-Schlatter's disease), and tarsal navicular bone (Köhler's disease), the nature of the process is not apt to be overlooked. There are some 20 other sites where the process has been described and where the unfamiliar appearance may suggest bone tumor. The case described below is considered an example of involvement of the ischiopubic synchondrosis (Van Neck's disease).

CASE 3.—A 7-year-old girl was thrown from a horse and was unconscious for five minutes. Two weeks later she complained of pain in the left hip and there was pain on internal and external rotation of the leg. There was improvement with symptomatic treatment. The next month cramping low abdominal pain with suprapubic and adnexal tenderness led to x-ray examination of the pelvis. There was a rather sharply defined area of diminished density at the ischiopubic synchondrosis, with calcification and ossification in adjacent soft tissue. Malignant bone tumor was considered, and biopsy was carried out. This showed granulation tissue, osteoid, bone, and fibrocartilage, which are the histological components of osteochondritis or aseptic necrosis. Follow-up films three months later were entirely normal in appearance.

TRAUMATIC LESIONS

A history of trauma is not the useful guide that might be expected in eliminating tumor, since, in examples of malignant bone lesions, an episode of injury is commonly related to the patient's discovery of the disease. Although the patient may see this as a causal relationship, medical interpretation favors coincidence. When trauma is remote, minor, or concealed, an appearance that simulates tumor may be too readily accepted as such.

Occult Trauma.—Particularly in children, accidental injury in play or severe punishment may lead a parent or guardian to deny any incident that would explain the abnormalities in question.

CASE 4.—A 6-month-old child was admitted with a swelling of the right shoulder and temperature of 102 F (38.8 C). The extensive calcification and ossification in soft tissue, with elevation of periosteum and displacement of the capital epiphysis of humerus, were x-ray evidence of trauma. Since no history of injury could be found, this diagnosis was reluctantly accepted. At 9 months of age the child was readmitted with swelling in the right groin. X-rays showed evidence of periosteal tear, soft-tissue calcification and ossification about the proximal third of the shaft of the femur, and displaced femoral epiphysis. Injury was still denied, but it was learned that both parents were alcoholics. Despite this, blood dyscrasia or scurvy was considered before accepting the diagnosis of occult trauma.

Fracture.—In roentgenograms simple fractures may, by chance, be completely obscured and greenstick fractures may show no deformity. The first roentgen sign may be periosteal reaction or local demineralization some days after an injury that is almost forgotten. The so-called March fracture or fatigue fracture has no recognized local injury. Although well recognized in military medicine, it is less frequently seen in civilian practice. The isolated example may give rise to concern for more serious disease.

Periosteal Injury.—Direct injury to bone that does not produce fracture may produce a subperiosteal hematoma with local periosteal elevation and new bone formation that would require consideration of Ewing's sarcoma if the history of injury were not available. Penetrating wounds may induce periosteal reaction due to foreign-body reaction, direct injury to the periosteum, or both. About the hands, the reaction to thorns may cause cortical erosion, osteoporosis, and periosteal elevation.[6] Intramuscular injections have the same potentiality.

Fig. 1.—Thin, dense, scalloped margins; cortical origin; and location in lower end of femur characteristic of nonossifying fibroma.

CASE 5.—A 47-year-old woman complained of an increasing mass and tenderness over the lateral aspect of the arm. Her history revealed she had received many intramuscular injections in both arms some two years previously. X-ray studies showed a rounded mass with an ossified base in continuity with the periosteum of the lateral aspect of the midshaft of the humerus. There was no change in underlying bone. On histological examination, osteosarcoma was considered, but the final diagnosis was bone and osteoid tissue.

Myositis Ossificans.—Under any circumstances, myositis ossificans, a sequela of trauma to periosteum and muscle, has an appearance that will cause concern. The association of injury and a well-defined lace-like pattern of ossification are not always adequate for diagnosis. Subperiosteal hemorrhage may lead to erosion and demineralization of bone, and there may be a tender soft-

6. Maylahn, D. J.: Thorn-Induced "Tumors" of Bone, J. Bone & Joint Surg. 34-A: 386-388, 1952.

tissue mass. When these features suggest primary bone tumor and lead to biopsy, the hazard of erroneous diagnosis still exists. A biopsy specimen showing bizarre giant cells, active osteoblasts and osteoclasts, and spindle-shaped fibroblasts may only strengthen a clinical suspicion of osteosarcoma. In some instances only detailed study after amputation and the subsequent uneventful course has established the diagnosis as myositis ossificans. Johnson [7] has described an example that developed after back injury and produced the radiological and histological appearance of giant-cell tumor involving a vertebral body but followed a clinical course consistent with myositis ossificans.

METABOLIC DISORDERS

In the group of metabolic disorders there are many conditions unrelated in etiology, appearance, or clinical course. They have in common only an imbalance in normal processes of tissue construction and destruction. The bizarre appearance of some of the conditions in this group is particularly apt to suggest malignant bone tumor when the x-ray examination is confined to one bone and when a single examination gives no opportunity to observe behavior over a period of time.

Fig. 2.—Lesion of Hand-Schüller-Christian disease (lipid histiocytosis of cholesterol type) appearing as an osteolytic lesion that occupies the distal half of tibia, producing a fusiform expansion of the shaft and causing periosteal new bone formation.

Lymphoma or Lipid-Storage Disease.—The eosinophilic granuloma or the solitary lesion of Hand-Schüller-Christian disease (lipid histiocytosis of cholesterol type) requires biopsy to establish diagnosis. The discovery of any solitary lesion should lead to a skeletal survey for the identification of the multiple, sharply defined defects scattered throughout the skeleton that will suggest the diagnosis even before histological examination.

CASE 6.—A 5-month-old male infant developed a swelling of the right leg accompanied by a temperature of 103 F (39.4 C). An x-ray examination was apparently interpreted as indicating fracture, for a plaster cast was applied. On removal of the cast, further examination and biopsy resulted in a diagnosis of lymphoblastoma. Radiotherapy was given for 15 treatments in three weeks, with local improvement and subsidence of fever. Two months later elevation of temperature recurred and nodules were discovered in the scalp. The patient was now admitted to the hospital, where a diagnosis of Hand-Schüller-Christian disease was established (fig. 2). Treatment with nitrogen mustard resulted in almost complete regression of all lesions during the next eight months.

In Gaucher's disease (lipid histiocytosis of kerasin type) there is a symmetrical distribution of radiolucent lesions expanding the tubular shafts of the ends of long bones, particularly the distal ends of femurs. There may be pathological fracture and deformity or aseptic necrosis of softened bone at the sites of mechanical stress, such as head of femur or humerus. The chance for error lies in recognizing only a single lesion through incomplete examination of the skeleton. Letterer-Siwe's disease occurring in children under 2 years of age most closely resembles widespread malignant disease, such as leukemia or metastatic neuroblastoma. Pulmonary involvement simulates metastases, and the course is uniformly and rapidly fatal.

Vitamin Deficiency.—In some sections of the United States clinical experience with vitamin deficiency diseases is scanty, and a typical picture may go unrecognized in favor of bone neoplasm. The untreated and well-developed example of scurvy should present no problem. The ring sign of the epiphysis, the fracturing and cornering of the dense brittle metaphysis, and the general demineralization are adequate criteria for diagnosis. The early healing phase, with beginning calcification of the subperiosteal hemorrhage, is a more startling picture, particularly if seen out of context of the full clinical history on development of the roentgen features. Again the diagnosis is likely to be evident if a complete skeletal survey is made.

Hyperparathyroidism.—A solitary destructive lesion or multiple osteolytic lesions may first suggest metastasis to bone from an undiscovered primary lesion. A complete skeletal survey and the indicated blood chemistry studies should avoid any inappropriate treatment to local manifestation of a systemic disease.

Osteitis Deformans.—The florid form of osteitis deformans (Paget's disease) and osteoblastic metastases from the prostate resemble each other very closely, but history and blood chemistry studies usually permit ready distinction. Involvement of a solitary bone by osteitis deformans is particularly likely to simulate the osteoblastic metastasis of carcinoma or Hodgkin's disease. The hazard is that the benign lesion may be treated as malignant, or, if it is considered a metastasis, this may militate against appropriate treatment of a recognized primary cancer.

INFECTION

At some time in the course of its development any infection of bone will simulate bone tumor because the elements of bone destruction, bone production, and perios-

7. Johnson, Lent C.: Personal communication to the authors.

teal reaction are common features. The course of the disease is the principal basis for roentgen differentiation, but this will not be evident in any single examination.

Pyogenic Osteomyelitis.—A fulminating process with bone destruction and osteoporosis as dominant features may closely resemble leukemic infiltration of bone. The antibiotics have modified the roentgen appearance and clinical course of osteomyelitis. The likely roentgen findings in the present day are periosteal reaction and minimal loss of cortical bone, appearing after initial symptoms have entirely cleared. If the first roentgen study is obtained at this time, the appearance may strongly suggest Ewing's sarcoma or osteosarcoma. Only careful consideration of recent history can offer basis for deferring biopsy.

Syphilis.—The roentgen appearance of congenital syphilis may bring to mind leukemic change in bone or diffuse skeletal metastases as from neuroblastoma or retinoblastoma. The common elements are bone destruction and periosteal elevation. The possibility of error is based very strongly on the occurrence of syphilis in families where it is least expected and radiological examination of a local area without reference to clinical findings or the appearance of the remainder of the skeleton.

Mycotic Infections.—Actinomycosis, coccidioidomycosis, blastomycosis, and cryptococcosis are the likely types of fungous infection of bone.[8] Any of these may simulate bone tumor, particularly if identified early in their development. Actinomycosis is characterized by diffuse increase in density of bone due to mixed bone production and bone destruction, with associated soft tissue involvement. Blastomycosis produces relatively circumscribed areas of bone destruction, with very marked periosteal new bone formation. Coccidioidomycosis is similar but with a lesser component of periosteal reaction. Cryptococcosis, or torulosis, most often produces areas of bone destruction at pressure points such as tuberosities or trochanters, with distinctive absence of bone reaction or periosteal elevation. An association of mycotic infection with leukemia and lymphoma has been noted.[9] The possibilities have been considered that the fungus has an etiological relation to the leukemia or lymphoma or that it is only a secondary invader. When an osteolytic lesion is encountered in association with a diagnosis of lymphoma, the possibility of an associated mycotic infection should be considered.

INFLAMMATION

Cortical Hyperostosis.—The outstanding example of a noninfectious inflammatory lesion of bone is benign cortical hyperostosis (fig. 3). Although it is not a common entity, it is becoming widely known, and the full-blown appearance is sufficiently characteristic that biopsy is unnecessary. The first examiner is always at a disadvantage, particularly if medical attention has been sought at an early stage. Monostotic involvement, with pain, swelling, and periosteal elevation, in the first year of life is suggestive of neoplasm, chiefly for lack of a more reasonable diagnosis. Before biopsy is undertaken, a careful skeletal survey should be made, with particular attention to the mandible, which is almost always involved.[10]

Osteoid Osteoma.—In the earliest recognized lesions, the small radiolucent area in the cortex is the prominent feature of osteoid osteoma. This is attended by reaction in surrounding bone that increases in time to such marked cortical thickening that the central defect cannot be identified. Extension of the osteosclerosis to involve more of the circumference and length of the shaft increases the resemblance to osteosarcoma. Although this lesion is sometimes considered as a benign neoplasm, it is classified here with the inflammatory conditions because the most obvious component is the osteosclerotic reaction of adjacent bone.

Osteitis Pubis.—Osteitis pubis, an aftermath of surgery of the bladder or prostate, may be recognized from the severity of the local symptoms. Because the surgery is often undertaken for cancer of the bladder or prostate, the possibility of metastatic disease is apt to be suggested by the extreme osteolytic reaction and periosteal new bone formation.

Fig. 3.—Cortical hyperostosis. *A*, in May right leg showed a painful swelling, but only roentgen findings were edema and questionable periosteal elevation involving both fibula and tibia. *B*, in July fibula had a fusiform contour due to layers of periosteal new bone. Tibia was not involved by same process but did show a "double periosteal contour." *C*, in August periosteal reaction of fibula showed further increase in amount and density. *D*, in November process had undergone resolution; cortex is of normal thickness, but contour of bone shows residual broadening.

8. Collins, V. P.: Bone Involvement in Cryptococcosis (Torulosis), Am. J. Roentgenol. **63**: 102-112, 1950.

9. Collins, V. P.; Gellhorn, A., and Trimble, J. R.: Coincidence of Cryptococcosis and Disease of Reticulo-Endothelial and Lymphatic Systems, Cancer **4**: 883-889, 1951.

10. Caffey, J.: Infantile Cortical Hyperostoses, J. Pediat. **29**: 541-559, 1946.

Hypertrophic Pulmonary Osteoarthropathy. — Although hypertrophic pulmonary osteoarthropathy develops as a bizarre response to primary pulmonary pathology, most often bronchogenic cancer, the first symptom may be local bone or joint pain and the first roentgen finding a periosteal reaction marked enough to suggest bone tumor. Adequate studies will show the changes to be bilaterally symmetrical in both upper and lower extremities, and the appearance is sufficiently distinctive to suggest the need for roentgenograms of the chest if such have not been taken.

BENIGN TUMORS OF BONE

Among the abnormalities of bone that are classified as benign tumors, the important diagnostic problems are those that from their clinical history, variable appearance, or unpredictable behavior cause clinical opinion to lean toward diagnosis of malignant tumor and treatment based on this diagnosis.

Fig. 4.—Giant-cell tumor, showing bone destruction and pathological fracture, with angulation and marked posterior displacement of the knee joint.

Benign Giant-Cell Tumor.—Although benign giant-cell tumors may occur in any age group, the majority are discovered in persons between the ages of 20 and 30 years. A destructive and expanding lesion involving the epiphysis will suggest the possibility of giant-cell tumor, but the diagnosis will usually be based on biopsy. Occasionally there is divided opinion among pathologists in differentiating giant-cell tumor and osteolytic osteosarcoma. In this circumstance the radiological appearance may carry weight in the decision as to therapy.

CASE 7.—A 25-year-old man gave a history of pain and increasing swelling of his left knee when he consulted his physician. The initial x-ray diagnosis was malignant bone tumor (fig. 4), but biopsy showed the condition to be a giant-cell tumor. For a variety of reasons treatment was deferred, and contracture of muscles was added to pathological fracture. It was surgical opinion that a satisfactory functional result could not be obtained, and amputation was carried out.

Chondroma.—The intramedullary chondroma is a familiar lesion. The periosteal chondroma [11] is less well known. The circumscribed cartilage mass produces a soft-tissue mass, with shallow erosion and sclerosis of the adjacent cortical bone. Despite the innocuous appearance of a circumscribed bone defect, and histologically benign characteristics, there is always the possibility that a solitary chondroma is a slowly growing chondrosarcoma. An exception is the enchondroma of hands or feet, which is not known to follow a malignant course.

Chondroblastoma.—The rare tumor chondroblastoma is important because it is a benign lesion that may at first strongly suggest malignancy to both radiologist and pathologist.[12] It has been described in the epiphysis of the femur, tibia, and humerus and in the bones of hands and feet. It is osteolytic in nature, with mottled calcification. The diagnosis is further suggested if the patient is male and in the 12-to-18-year age group. Histologically, it bears some resemblance to giant-cell tumor, but with prominent focal necrosis and calcification and areas of chondroid and osteoid matrix.

SUMMARY

Whenever an unusual or unexplained appearance of bone is encountered, a diagnosis of malignant bone tumor is apt to be entertained. Concern that any delay may jeopardize the chance for cure may lead to precipitate diagnostic or therapeutic measures not appropriate for a benign lesion. A systematic approach to differential diagnosis may indicate benign possibilities that merit a more conservative approach to management. The appearance of any single lesion on any one examination is often compatible with a variety of diagnoses and may even favor malignant tumor. Examination of the entire skeleton, with the advantage of clinical information, and, if possible, an opportunity to note any change in roentgen appearance over an interval of time, will aid in prompt recognition of benign lesions of bone and prevention of unnecessarily radical treatment.

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11. Lichtenstein, L., and Hall, J. E.: Periosteal Chondroma: Distinctive Benign Cartilage Tumor, J. Bone & Joint Surg. **34-A**:691-697, 1952.

12. Lichtenstein, L., and Kaplan, L.: Benign Chondroblastoma of Bone: Unusual Localization in Femoral Capital Epiphysis, Cancer **2**: 793-798, 1949.

Combined Chlorpromazine-Reserpine Therapy.—The introduction of chlorpromazine and reserpine into the therapeutic armamentarium of the practicing physician has posed the problem of which drug to use in which type of nervous or mental disorder. The evaluation of the effectiveness of any treatment in psychiatric cases has always been difficult. This is made even more difficult when one is dealing with two drugs which are so similar in action and yet so consistent in their effect from one case to another. . . . The same patient may not be able to tolerate one drug and yet respond nicely to the other. Much time is lost trying to find out which drug is the more effective. As a consequence, an increasing number of patients are being started on combined chlorpromazine-reserpine therapy initially, with satisfactory results. . . . There appears to be a synergistic action that gives maximum benefit with minimum side-effects. Therapeutic delay is minimized by initiating treatment with combined chlorpromazine and reserpine, rather than by experimenting first with one and then with the other drug to see which is more beneficial.—F. Lemere, M.D., Combined Chlorpromazine-Reserpine Therapy of Psychiatric Disorders, *A. M. A. Archives of Neurology and Psychiatry*, July, 1955.

LONG-TERM OUTLOOK FOR HEALED SUBACUTE BACTERIAL ENDOCARDITIS

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• Subacute bacterial endocarditis, which formerly was almost always fatal, can now be healed by antibiotics in many cases. Permanent recovery can be expected in 65 to 70% of the treated patients. This is illustrated in the present report on 17 patients in whom the diagnosis had been based on the clinical evidence and on positive blood cultures. In four patients the infection was superposed upon a preexistent congenital lesion. They have been observed for periods from 6½ to 10 years after successful treatment. The histories show that some patients, especially if youthful, now recover without any residual disability.

A gradual change in the natural history of many infectious diseases has occurred since antibiotics have been introduced. This is best exemplified, perhaps, by subacute bacterial endocarditis, which before penicillin was introduced was almost always fatal [1] and now has a mortality rate of about 24% immediately and 30 to 35% over all.[2] The difference between the immediate and over-all death rates is due for the most part to complications, particularly heart failure, that develop in patients with healed subacute bacterial endocarditis. There is need of determining how significant such complications are in the years that follow healing of the active infectious stage of the disease. This is the way to establish the natural history of healed subacute bacterial endocarditis and to determine its long-term prognosis. It is important, too, to distinguish the progressive effects on the patient and his heart that resulted from the bacterial endocarditis from those that resulted from the underlying disease upon which endocarditis was engrafted. Does subacute bacterial endocarditis, when healed, affect the heart and alter the prognosis of the patient? Studies on this point have appeared,[3] including our earlier report,[4] but there is a paucity of data on healed subacute bacterial endocarditis in patients followed for 5 to 10 years. To give such data is the purpose of the present study. This communication deals with a further follow-up of patients with subacute bacterial endocarditis successfully treated at Michael Reese Hospital between 1944 and 1947; in each case the diagnosis was based on the clinical evidence and upon positive blood cultures. A report on these patients was made in 1949 that covered the first two to five years of healed endocarditis.[4] In the present report the observation period after the disease was healed ranged from 6½ to 10 years, one of the longest periods of observation in the literature.

RESULTS

In brief, the initial 14 of our patients were reported on in 1946,[5] and 4 more were added later and included in our second report.[4] Three of the patients in the first group had died by the time of the first follow-up in 1949 [4] and were so listed at that time. Two of the remaining 15 patients have since died, and trace of one is lost, leaving the 12 that are discussed in detail in this report. Thus, there has been a mortality of 5 out of 18, and possibly 6 out of 18, in the healed cases followed for a period of up to 10 years. The patients were classified into three groups: (1) those who died, (2) those who showed evidence of cardiovascular deterioration, and (3) those who showed essentially no cardiovascular deterioration. The data are summarized in tables 1, 2, and 3. Brief individual case histories of the last two groups are given below. It was found that, of the 12 who were known to have survived for the 6½ to 10 years at the time of their reexamination, 7 showed no apparent effect on the basic cardiac disease. The other five had some evidence of cardiac progression.

REPORT OF CASES

Group Showing Cardiovascular Deterioration

CASE 6.—A boy, 17 years old at the time of treatment for subacute bacterial endocarditis, was discharged in January, 1947, after 32 days of therapy with the diagnosis of healed subacute bacterial endocarditis, aortic insufficiency, and mitral valvular disease. The patient's only symptom at present is occasional dyspnea on exertion; however, he works full time at a clerical job without any other difficulty. Physical examination revealed the blood pressure to be 180/0 mm. Hg and the pulse 88 and of the "water-hammer" type. Prominent pulsations of the episternal notch were present. The heart was enlarged to the left. A harsh, grade 3 diastolic murmur and a grade 2 systolic murmur were noticed. Both were heard over the entire precordium but were loudest in the aortic area. Radiographically there was left ventricular enlargement, the aorta was hyperdynamic and ectatic, and the heart-chest transverse diameter ratio 0.47. The electrocardiogram revealed chronic strain of the

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1. Libman, E.: Consideration of Prognosis in Subacute Bacterial Endocarditis, Am. Heart J. **1**: 25, 1925; A Further Report on Recovery and Recurrence in Subacute Bacterial Endocarditis, Tr. A. Am. Physicians **48**: 44, 1933.

2. (*a*) Donzelot, E.; LeBozec, J. M.; Kaufmann, H., and Escalle, J. E.: Le pronostic de l'endocardite infectieuse subaiguë traitée par les antibiotiques: résultats du traitement de 202 cas, Arch. mal. cœur **46**: 97, 1953. (*b*) Hunter, J. H.: Bacterial Endocarditis, Mod. Concepts Cardiovas. Dis. **22**: 172, 1953.

3. (*a*) Correll, H. L.; Lubitz, J. M., and Lindert, M. C. F.: Bacterial Endocarditis: Clinico-Pathologic Studies of Untreated and Cured Patients, Ann. Int. Med. **35**: 45, 1951. (*b*) Gorlin, R.; Favour, C. B., and Emery, F. J.: Long-Term Follow-Up Study of Penicillin-Treated Subacute Bacterial Endocarditis, New England J. Med. **242**: 995, 1950. (*c*) Jones, A. M.; Herring, R.; Langley, F. A., and Oleesky, S.: Penicillin Treatment of Subacute Bacterial Endocarditis, Brit. Heart J. **9**: 38, 1947. (*d*) Pillsbury, P. L., and Fiese, M. J.: Subacute Bacterial Endocarditis: Follow-Up Study of 30 Patients Treated with Penicillin, Arch. Int. Med. **85**: 675, 1950. (*e*) Rapoport, B., and Ellis, L. B.: The Effect of Subacute Bacterial Endocarditis on the Course of Underlying Heart Disease, New England J. Med. **239**: 951, 1948. (*f*) Donzelot and others.[2a]

4. Kaplan, S. R.; Rosenman, R. H.; Katz, L. N., and Brams, W. A.: Healed Subacute Bacterial Endocarditis, A New Entity, J. A. M. A. **141**: 114 (Sept. 10) 1949.

5. Mokotoff, R.; Brams, W.; Katz, L. N., and Howell, K. M.: The Treatment of Bacterial Endocarditis with Penicillin: Results of 17 Consecutive Unselected Cases, Am. J. M. Sc. **211**: 395, 1946.

left side of the heart without evidence of progression from previous studies. At the time of the most recent examination, six and one-half years after the healing of the endocarditis, clinical findings were suggestive of aortic insufficiency and probably of aortic stenosis.

CASE 7.—A boy, 15 years old at the time of treatment for subacute bacterial endocarditis, was discharged in May, 1947, after 25 days of therapy with the diagnosis of healed subacute bacterial endocarditis and rheumatic heart disease with aortic insufficiency. He had been free of symptoms until September, 1954, when he developed exertional dyspnea and swelling of the ankles. Examination revealed the blood pressure to be 180/0 mm. Hg and pulse 108 and of the "water-hammer" type. There were dyspnea at rest and orthopnea. The heart was enlarged, and a systolic thrill and murmur were present over the second right intercostal space and over the third left intercostal space near the sternum. A loud diastolic murmur was heard over the same areas. Roentgenologic examination revealed enlargement of the left ventricle and marked increase in cardiac size since the examination in 1949; the heart-chest transverse diameter ratio went from 0.53 in 1949 to 0.68 in 1954. The electrocardiogram showed an incomplete left bundle-branch system block due to progressive strain of the left side of the heart. Three blood cultures were sterile. The cardiac failure responded to bed rest, digitalis, and diuretic therapy. It is to be noted that at the time of this present examination, seven years after the patient had subacute bacterial endocarditis, the clinical findings are compatible with those of aortic stenosis and of aortic insufficiency.

CASE 8.—A woman, 51 years old at the time of treatment for subacute bacterial endocarditis, was discharged in September, 1944, after 21 days of therapy with the diagnosis of healed endocarditis, rheumatic heart disease with mitral insufficiency,

TABLE 1.—*Data on Patients Who Died After Recovery from Subacute Bacterial Endocarditis**

Case No.†	Age at Time of S.B.E.‡	Age at Time of Death	Time from Discharge to Death, Mo.	Units of Penicillin, Millions	Underlying C.V. Disease	Cause of Death
1	36	37	8	16.8	Syphilitic aortitis, M.D. + A.I.	Progressive heart failure; pulmonary embolism and infarction
2	15	16	9	52.6	R.H.D., M.D. + A.I.	Progressive heart failure
3	60	64	39	9.3	R.H.D., M.D. + A.I.	Progressive heart failure; bronchopneumonia
4 (7)	36	43	79	5.6	R.H.D., M.S. + A.I.	Congestive heart failure; purulent peritonitis
5 (11)	50	55	At least 55 §	9.1	Essential hypertension, M.I.	Unknown

* Congestive failure developed during subacute bacterial endocarditis or after recovery from infection in all the patients who died.
† Numbers in parentheses are the case numbers used in the earlier study on these patients.
‡ See table 3 for glossary of abbreviations.
§ Actual time of death is unknown.

TABLE 2.—*Data on Patients with Evidence of Cardiovascular Deterioration*

Case No.*	Age at Time of S.B.E.†	Units of Penicillin, Millions	Observation Time, Yr.	Underlying C.V. Disease	Follow-Up Study		
					Clinical Course	E.C.G. Changes	Roentgenographic Changes in Cardiac Size
6 (5)	17	22	6½	R.H.D., A.I., and probably A.S.	Occasional dyspnea on exertion; otherwise unchanged	None	None
7 (6)	15	30	7	R.H.D., A.S. + A.I.	Asymptomatic for 7 yr.; developed cardiac failure	Progressive L.H.S. with incomplete LBBsB	Marked increase
8 (10)	51	4.2	9	Hypertensive and R.H.D., M.I.	Mild cardiac failure; no digitalis; B.P. 236/118 mm. Hg	None	None
9 (12)	35	4.2	8½	R.H.D., M.I.	Mild cardiac failure; no digitalis	None	None
10 (14)	22	4.2	8½	I.V. septal defect	Recurrences of S.B.E.; episodes of paroxysmal tachycardia; mild cardiac failure; no digitalis	Suggests incomplete RBBsB	None

* Numbers in parentheses are the case numbers used in the earlier study on these patients.
† See table 3 for glossary of abbreviations.

TABLE 3.—*Data on Patients with Essentially No Cardiovascular Deterioration*

Case No.*	Age at Time of S.B.E.†	Units of Penicillin, Millions	Observation Time, Yr.	Underlying C.V. Disease	Follow-Up Study		
					Clinical Course	E.C.G. Changes	Roentgenographic Changes in Cardiac Size
11 (4)	19	8.1	10	Patent ductus arteriosus (ligated 5/49)	Signs of dynamic A.I. have disappeared; normal blood pressure	Signs of L.H.S. much less pronounced	Return to upper limits of normal
12 (8)	21	15.1	8	R.H.D., M.S. + A.I.	Unchanged	None	None
13 (9)	32	6.5	7½	R.H.D., A.I.	Occasional episodes of palpitations at rest; otherwise unchanged	None	Slight increase in size of L.V.
14 (13)	17	151	8	R.H.D., M.I.	Unchanged	Contour unchanged (W.N.L.)	None
15 (15)	22	3.6	8½	Dextrocardia + I.V. septal defect	Unchanged	None	None
16 (16)	12	4.9	7½	I.V. septal defect	Unchanged	None (W.N.L.)	None
17 (18)	6	4.2	9	No definite cardiac lesion	Unchanged	None (W.N.L.)	None (normal)

* Numbers in parentheses are the case numbers used in the earlier study on these patients.
† S.B.E. = subacute bacterial endocarditis, R.H.D. = rheumatic heart disease, M.D. = mitral disease, M.S. = mitral stenosis, M.I. = mitral insufficiency, A.S. = aortic stenosis, A.I. = aortic insufficiency, W.N.L. = within normal limits, L.H.S. = left heart strain, LBBsB = left bundle-branch system block, and RBBsB = right bundle-branch system block.

and essential hypertension. She has been having some exertional dyspnea and intermittent swelling of the legs. Examination revealed the blood pressure to be 236/118 mm. Hg and the pulse 80. The heart was enlarged to the left. There was a grade 3 systolic murmur at the apex as well as a short diastolic apical murmur. The liver was enlarged, and minimal pretibial pitting edema was present. The left ventricle was enlarged, there was slight enlargement of the left auricle, and the heart-chest transverse diameter ratio was 0.55 by radiographic examination. The electrocardiogram showed strain of the left side of the heart.

CASE 9.—A woman, 35 years old at the time of treatment for subacute bacterial endocarditis, was discharged in January, 1944, after 21 days of therapy with the diagnosis of healed endocarditis and rheumatic heart disease with mitral insufficiency. In 1951 she experienced an episode of congestive failure with cough, dyspnea, and tachycardia. Since that time she has been on a low-salt diet. She experiences occasional episodes of palpitations. Physical examination revealed a blood pressure of 164/70 mm. Hg and a pulse of 72 with occasional premature beats. The heart was enlarged to the left, and there was a grade 3 apical systolic murmur. The second pulmonic sound was split and louder than the second aortic sound. The liver was enlarged. Radiographic examination revealed left ventricular and left auricular enlargement, normal-appearing lung fields, and a heart-chest transverse diameter ratio of 0.52. The electrocardiogram showed a sinus arrhythmia with wandering of the pacemaker to the atrioventricular node and strain of the left side of the heart but without progression in the last four years.

CASE 10.—A woman, 22 years old at the time of treatment for subacute bacterial endocarditis, was discharged in January, 1945, after 21 days of therapy with the diagnosis of healed endocarditis and an interventricular septal defect. Since discharge she has gone through three normal pregnancies. She has had episodes during the last four years in which she runs a low grade fever and develops many petechiae and purpuric spots, but repeated blood cultures have been negative. She has an increased bleeding tendency and has had bleeding from the vagina, bladder, rectum, and gingiva. Along with these episodes of bleeding, there have been periods of tachycardia that end when the bleeding stops. The cardiac status has been deteriorating, with a present functional capacity of class 2 to 3. Examination revealed a blood pressure of 126/86 mm. Hg and a pulse of 96. The heart was enlarged to the left. There was a systolic thrill and a grade 3 systolic murmur, both with maximum intensity at the fourth and fifth left intercostal spaces near the sternum. The heart-chest transverse diameter ratio was 0.63, with additional roentgenologic evidence of left ventricular inflow and outflow tract enlargement. The electrocardiogram revealed an incomplete right bundle-branch system block.

Group Showing Essentially No Cardiovascular Deterioration

CASE 11.—This patient was a woman 19 years old at the time of treatment for subacute bacterial endocarditis in August, 1944. Three blood cultures yielded Streptococcus viridans. The disease was complicated by multiple pulmonary infarcts and infectious mononucleosis. She received 42 days of penicillin therapy and was discharged with the diagnosis of healed endocarditis and patent ductus arteriosus. She showed progressive left ventricular enlargement with progressive strain of the left side of the heart in the electrocardiogram. In 1949 the ductus was ligated, and the patient has been completely asymptomatic since recovery from surgery. Physical examination (September, 1954) was negative except for a soft systolic murmur along the left sternal margin. Roentgenologic examination revealed an increase in the transverse diameter of the heart at the apex and the base, with a heart-chest transverse diameter ratio of 0.51. The electrocardiogram showed further regression of the heart strain pattern.

CASE 12.—A woman, 21 years old at the time of treatment for subacute bacterial endocarditis, was discharged in March, 1945, after 56 days of penicillin therapy with the final diagnosis of healed endocarditis, rheumatic heart disease, mitral stenosis, and aortic insufficiency. She states that she has had frequent showers of petechiae since having had bacterial endocarditis. On practically all of these occasions blood cultures were taken and were negative. Otherwise she is asymptomatic. Examination revealed the blood pressure to be 140/78 mm. Hg, pulse 82. Although no petechiae were present, there was a positive "tourniquet test" produced by the blood pressure cuff. The heart was enlarged to the left, and a grade 3 diastolic murmur was present, loudest at Erb's point and the aortic area. A mid-diastolic rumble was heard at the apex where the first sound was accentuated. A blood culture showed no growth. Radiographic examination revealed left ventricular enlargement, prominent pulmonary conus, enlarged and hyperdynamic aortic knob. There was no left auricular enlargement, the heart-chest transverse diameter ratio was 0.58, and the lung fields were normal. The electrocardiogram was compatible with chronic left heart strain.

CASE 13.—A man, 32 years old at the time of treatment for subacute bacterial endocarditis, was discharged in December, 1945, after 22 days of therapy with the diagnosis of healed endocarditis, rheumatic heart disease, aortic insufficiency, and mitral stenosis. Except for having had occasional episodes of palpitations, he has been asymptomatic. Physical examination revealed the blood pressure to be 140/80 mm. Hg and the pulse 84. The heart was enlarged to the left, and a grade 3 diastolic murmur was present, loudest at the aortic area. The heart-chest transverse diameter ratio was 0.45, with radiographic evidence of left ventricular enlargement and widening and elongation of the aorta. The electrocardiogram was abnormal and suggested strain of the left side of the heart without evidence of progression. At the time of this examination, seven and a half years after recovery from subacute bacterial endocarditis, examination revealed only acoustical evidence of aortic insufficiency.

CASE 14.—A boy, 17 years old at the time of treatment for subacute bacterial endocarditis, was discharged in December, 1945, after 38 days of penicillin therapy with the final diagnosis of healed endocarditis, rheumatic heart disease, and mitral insufficiency. He has had frequent costovertebral angle tenderness associated with the passing of dark urine; however, he states that this has been present since having had subacute bacterial endocarditis. He gives no history of cardiac symptoms. Examination revealed the blood pressure to be 166/80 mm. Hg, pulse 96. No evidence of heart enlargement was present, but a grade 2 or 3 systolic murmur was noticed, loudest at the apex. The liver was enlarged. The remainder of the physical examination was negative. The heart-chest transverse diameter ratio was 0.41, with radiographic data suggesting some left ventricular hypertrophy. The lung fields were normal. The electrocardiogram was within normal limits.

CASE 15.—A woman, 22 years old at the time of treatment for subacute bacterial endocarditis, was discharged in December, 1944, after 18 days of therapy with the diagnosis of healed endocarditis and an interventricular septal defect. She has been free of symptoms except for occasional substernal pain and palpitation on exertion. Physical examination revealed the blood pressure to be 146/80 mm. Hg and pulse 52, with occasional periods of a more rapid rate. The first sound varied in intensity and was followed by a grade 3 systolic murmur, loudest at the aortic area and to the left of the sternum in the third intercostal space. A systolic thrill was present, with its maximum intensity in the latter area. Roentgenologic examination revealed enlargement of the outflow tract of the right ventricle and a centrally placed heart, with a heart-chest transverse diameter ratio of 0.43. The electrocardiogram revealed sinus rhythm, advanced auriculoventricular block with incomplete auriculoventricular dissociation and a contour suggesting dextrocardia.

CASE 16.—A boy, 12 years old at the time of treatment for subacute bacterial endocarditis, was discharged in January, 1945, after 25 days of penicillin therapy with the diagnosis of healed endocarditis and an interventricular septal defect. He has been asymptomatic since discharge. Physical examination revealed a blood pressure of 126/94 mm. Hg and a pulse of 80. A harsh, grade 3 systolic murmur was present in the third left intercostal space near the sternum, at which point there was a systolic thrill. The heart-chest transverse diameter ratio was 0.52, with radiographic evidence of left ventricular enlargement. Pulmonary markings were prominent but unchanged since the earlier study in 1949. The electrocardiogram was within normal limits.

CASE 17.—A boy, 6 years old at the time of treatment for subacute bacterial endocarditis, had an elevated temperature two days after a tonsillectomy in August, 1944. Three blood cultures were positive for beta hemolytic streptococci. During the course of his illness a harsh systolic murmur was heard at the apex, with transmission toward the axilla. It waxed and waned in intensity and became faint toward the end of the disease. He was discharged in September, 1944, after 21 days of penicillin therapy. No definite diagnosis of rheumatic or congenital heart disease has ever been made. The history and systemic review were entirely negative. Physical examination revealed the blood pressure to be 120/70 mm. Hg and the pulse 104. There was a soft systolic murmur in the third left intercostal space near the sternum and of even lesser intensity in the aortic area. The second pulmonic sound was split and louder than the second aortic sound. Radiographic examination showed a vertical heart without evidence of enlargement. The lung fields appeared normal. The electrocardiogram was within normal limits.

COMMENT

Let us examine the evidence to see whether healed subacute bacterial endocarditis affected the clinical course of these patients. First, it is essential to see if any differences exist in the location of the subacute bacterial endocarditis, or in the underlying disease, between those cases in which there was cardiovascular deterioration and/or death and those in which over the 6½ to 10 years there was essentially no such cardiovascular deterioration.

In the seven patients with essentially no cardiovascular deterioration, there were included two with rheumatic aortic insufficiency, one also having a mitral stenosis. In both, the aortic valvular defect was diagnosed on acoustical grounds, and in both there was no evidence that the insufficiency was of dynamic significance; i. e., there was no widened pulse pressure and no significant left ventricular enlargement and/or strain on clinical, radiographic, or electrocardiographic examination. This is in contrast with two patients in the group with cardiovascular deterioration associated with aortic insufficiency in whom there is evidence that the valve defect was of dynamic significance as evidenced by markedly widened pulse pressures, objective evidence of left ventricular strain, or enlargement and symptoms of left-sided heart failure. Furthermore, four of the five patients who died had aortic insufficiency, and in three of them it was dynamically significant. The fact that aortic insufficiency is a common factor in patients with progressive cardiovascular deterioration following recovery from subacute bacterial endocarditis is indicated by the fact that four of the five patients who died had this lesion. It was also seen earlier in this group of patients,[4] and by the greater incidence of this valvular lesion in the patients reported on by Glaser and co-workers,[6] Honigman and Karns,[7] Jones and associates,[3c] Pillsbury and Fiese,[3d] and Rosenblatt and Loewe.[8] It does not follow that in our patients progression of their disease or eventual death was secondary to their having had subacute bacterial endocarditis, since it has been shown that, in general, the prognosis of patients with marked aortic regurgitation is poor even without the intervention of endocarditis [9] and even worse when both mitral and aortic valves are involved.[3a] As to the three patients with rheumatic heart disease in whom only the mitral valve was involved, one was in the group without cardiovascular deterioration; the other two patients did show such changes. Again it is not certain that the progression in the latter two was due to the healed subacute bacterial endocarditis.

Only one of the four patients with a congenital lesion showed cardiovascular deterioration with clinical episodes suggestive of recurrence of bacterial endocarditis. Of the two patients with hypertension, one died and the other showed cardiovascular deterioration. Of the five patients with combined aortic and mitral valve lesions, four died, and one showed no cardiovascular deterioration. It is thus noted that recovery from subacute bacterial endocarditis can occur without residual disability due to the healed lesion and, apparently, without altering the course of the underlying disease over a number of years. This was recently pointed out by another group.[9a] It would appear, however, that in dynamically significant aortic insufficiency the occurrence and healing of the endocarditis appear to be associated with progession of disability. Whether this is coincidental or not cannot be established.

Age at the time of infection would appear to have some relation to the prognosis. The average age at time of infection was 39.8 years in those who died, was 28 years in those showing cardiovascular deterioration, and was 18.4 years in those showing no progression. Only one of the entire group of 17 patients had clinical evidence of episodes of reinfection. Three of the patients developed bundle-branch system block after infection. One of these died, and the other two showed cardiovascular deterioration. This is in keeping with the observation of Donzelot and associates [2a] that the development of bundle-branch system block during the course of treatment of subacute bacterial endocarditis, or its presence before it, is a poor prognostic sign. The only other significant change in the electrocardiograms occurred in the patient in whom a patent ductus arteriosus was ligated, where the signs of the strain of the left side of the heart became much less pronounced. This patient was the only one in whom there was reduction of the cardiac size as measured roentgenographically.

In recent years, several other reports, besides our earlier one,[4] have appeared concerning follow-up studies in penicillin-treated patients who have recovered from the disease. Thus, Dawson and Hunter,[10] in 1946, reported on 15 patients, with a follow-up period ranging from 11 to 32 months and averaging 18 months. All of them were in good general health. Jones and associates,[3c] in 1947, reported on 18 patients who were alive and free

6. Glaser, J.; Smith, R. O.; Hartford, C. G., and Wood, W B., Jr.: The Treatment of Bacterial Endocarditis with Penicillin, J. Lab. & Clin. Med. **31**: 291, 1946.

7. Honigman, A. H., and Karns, J. R.: Healed Subacute Bacterial Endocarditis: Report of 2 Cases with Death Due to Congestive Heart Failure, Ann. Int. Med. **26**: 704, 1947.

8. Rosenblatt, P., and Loewe, L.: Healed Subacute Bacterial Endocarditis, Arch. Int. Med. **76**: 1 (July) 1945.

9. White, P. D.: Heart Disease, ed. 4, New York, the MacMillan Company, 1951. Cecil, R. L., and Loeb, R. F.: A Textbook of Medicine, ed. 8, Philadelphia, W. B. Saunders Company, 1951. Donzelot and others.[2a]

9a. Priest, W. S., and Smith, J. M.: The Effect of Healed Subacute Bacterial Endocarditis on Cardiac Dynamics, A. M. A. Arch. Int. Med. **95**: 646, 1955.

10. Dawson, M. H., and Hunter, T. H.: The Treatment of Subacute Bacterial Endocarditis with Penicillin: Second Report, Ann. Int. Med. **24**: 170, 1946.

from signs of infection after the completion of treatment. In two of them the follow-up study was over 18 months. Most of the patients who recovered noticed no change in their capacity for exertion. Although most of them resumed their old occupation, some of them presented objective evidence of increased cardiac damage as demonstrated by progressive cardiac enlargement. The progressive cardiac enlargement accompanying the untreated disease usually stops; however, enlargement that has already taken place is generally irreversible.

Rapoport and Ellis,[3e] in 1948, reported a study of 11 patients followed over a period of two to three years. All of them were feeling as well as they had before their illness. In four of these patients cardiac size decreased; in the other seven there was no change. Three of the patients in the latter group developed additional clinical or electrocardiographic evidence of increased cardiac damage.

Of the 27 patients of Gorlin and his colleagues [3b] who remained cured for more than one year, the observation time in 9 was from four to six years. Seventy-five per cent of their entire group of patients who recovered showed no permanent ill-effects from the infection. In the group of Pillsbury and Fiese,[3d] the average observation time was 35 months, with the longest observation period being 47 months. Of the 20 patients who survived, 17 (85%) were without cardiac symptoms. Of those surviving, all but eight showed clear-cut evidence of cardiac damage, determined by electrocardiogram, by roentgenographic measurements of heart size, or by both methods.

Donzelot, Bozec, and others,[2a] in a recent report on prognosis of subacute bacterial endocarditis treated by antibiotics, point out that permanent recovery can be expected in 65 to 70% of the treated patients, the observation time having lasted in some of them for as long as seven years after termination of the treatment. Our own results are in line with these observations. They establish the fact that this previously fatal disease can be healed and that patients may live for up to 10 years and probably longer afterward, without disability. If, however, the underlying disease has been severe, if the patient is older, and especially if he has had a dynamically significant aortic regurgitation, his outlook is less favorable. There is no doubt, therefore, that there is such a state as healed subacute bacterial endocarditis with its own natural history.

SUMMARY

This is a further report on 17 patients, 6½ to 10 years after successful treatment of subacute bacterial endocarditis with penicillin. In general the course of the survivors at this time (1954) is in accord with the last report in 1949 but covers a longer period. Five patients have died between 8 and 79 months after treatment. Seven patients have remained asymptomatic 7½ to 10 years after recovery from infection. When aortic valvular regurgitation is the underlying disease the prognosis seems less favorable. The age at the time of infection also appears to affect the prognosis, the younger patients having a more favorable outlook.

ADDENDUM

Since the time of writing of this report, two patients, both in the group showing cardiovascular deterioration, have died. One is the patient in case 7. He had been seen frequently in the clinic since his discharge from the hospital in September, 1954. Symptoms of heart failure were controlled until April, 1955, when he developed auricular fibrillation with a rapid ventricular rate. This responded to supplementary digitalis therapy, but he died suddenly in May. Autopsy revealed pulmonary edema, hydrothorax, a markedly enlarged heart, and healed endocarditis of the aortic valve with insufficiency and stenosis. The second patient was discussed in case 10. This patient is the only one who showed evidence of recurrence of subacute bacterial endocarditis during the years following the original infection. She recently entered the Albert Merritt Billings Hospital of the University of Chicago with a high fever that did not respond completely to antibiotic therapy. Candida albicans was isolated from blood cultures. The infection did not respond to fungicidal agents, and the patient died. Autopsy revealed endocarditis of the tricuspid valve with superimposed infection with C. albicans. No congenital lesion was found. Details of this patient's last hospitalization were supplied by Dr. Emmet B. Bay of the Albert Merritt Billings Hospital.

Cold Injury.—From a clinical standpoint, an analogy can be drawn which suggests that nerve damage may be the primary factor in the potentiation of the late symptoms of cold injury. Syndromes seen in patients with cold sequelae and in those with nerve injury due to other types of physical trauma have a number of features in common. . . . Irritative lesions of sensory nerves are capable of producing glossy skin, coldness, hyperidrosis, hyperesthesias, and pain. These features may be separate manifestations of nerve injury which only in rare instances occur all in combination. They may also be present in variable combinations. This explanation would coordinate a number of the major symptoms in patients with sequelae, and is supported by the studies of sweating and the vasomotor changes in the early postfrostbite syndrome which have also suggested this picture. . . . Following cold injury, some individuals may have only negligible symptoms, such as mild reactivity to cold. Others are disabled with any activity or with a gainful occupation; in addition they may have associated psychic factors of such severity that evaluation is difficult. In the diagnosis and management of these patients as they are seen sporadically in civil life, the following factors are important: An accurate and preferably substantiated history of cold injury is requisite. If this specific information is not obtained, the diagnosis of cold injury should be doubted. A helpful and informative approach would be careful follow-up of each patient from the time of injury throughout the entire course of illness. In patients with late cold injury syndromes, the integrated clinical picture is most informative. Organic vascular disease, syndromes with sympathetic overactivity, and malingering must be differentiated. Present laboratory methods have not been of specific aid in the diagnosis of cold injury residuals, even when studies of known injured have been compared with normal controls. These, however, have usually been methods to evaluate the circulatory status of these patients. Specialized procedures, as skin temperatures, oscillometric and cold-room studies, have shown largely evidence of increased vasomotor activity in some individuals, a finding present in other peripheral vascular states. Roentgenographic studies do not demonstrate diagnostic changes. Management of these patients is inadequate, although symptomatic relief of varying degree can be obtained in some individuals.—J. C. Shafer, M.D., and A. W. Thompson, M.D., Local Cold Injury, *A.M.A. Archives of Dermatology*, October, 1955.

SOME ASPECTS OF OCCUPATIONAL DERMATOSES

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• *A study of the causes of cutaneous disease disclosed evidence of occupational origin in almost 50%. Of these, several hundred were caused by repeated exposure to primary irritants such as acids and organic solvents, but no case of occupational dermatosis resulted in permanent disability. Dermatitis also resulted from single, nonhabitual injuries such as splashing and physical trauma. This included some cases of eczematous dermatitis from occlusive dressings. Patch tests were frequently found to have been misused or misinterpreted. When change of work was not possible, improved techniques and attention to hygiene usually enabled the worker to return to his job without recurrence of symptoms.*

My purpose is to discuss the following aspects of occupational dermatoses: pitfalls in diagnosis, patch tests, certain concepts, prognosis, period of disability, and period of recovery. To facilitate this, actual causes of occupational dermatoses as I observed them will be presented. The table is compiled from a total of 5,483 cases of cutaneous diseases in patients observed by me who were claimants under the Pennsylvania law governing workmen's compensation. Of the 5,483 patients, I regarded the diseases of 2,407 (43.8%) as occupational in origin. These patients were workers in many industries in the highly industrialized region of eastern Pennsylvania and in the vicinity of bordering states. Not all industries or occupations are represented. The actual causes as I have grouped them represent the predominating, but not all, causes of occupational dermatoses.

Actual Causes of Occupational Cutaneous Disease in 2,407 Cases

	Cases	
	No.	%
Primary irritants (such as acids, alkalis, nonaqueous solvents)	667	27.7
Trauma and accidental injury	532	22.1
Sensitizing substances	366	15.2
Wet work (water alone, soap and water, and alkaline salt detergents)	362	15.0
Cleansing agents applied to the skin	239	9.9
Petroleum products and other causes (hydrochlorinated hydrocarbons, tar, pitch, sugar, flour, dust) of folliculitis	185	7.6
Physical and biological agents	56	2.3
	2,407	

The breakdown of actual causes into groups, as shown in the table, is desirable since attention is focused on these causes, prevention and investigative measures are suggested, and teaching and discussion of the subject are facilitated.

The nonoccupational group comprised all varieties of common and uncommon diseases of the skin, some of which are never of occupational origin. It is pertinent here to quote Gordon [1] on history taking in industrial cases: "The merest hint that some preliminary investigation may be necessary before the diagnosis is accepted, brings the dermatologist's competence into question and induces a state of passive resistance. The workman has never had anything wrong with his skin before he adopted his present employment . . . there is nothing wrong with his general health; his blood is pure . . . half the workmen in his factory suffer from this complaint. . . . To the lay public only two skin diseases are known. The unemployed suffer from eczema and those in trades suffer from dermatitis." Diagnosis, therefore, of the cutaneous manifestation is of prime importance and is in the domain of a qualified dermatologist.

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1. Gordon, S.: Industrial Dermatoses, South African M. J. **24**: 725, 1950.

2. Klauder, J. V., and Gross, B. A.: Actual Causes of Certain Occupational Dermatoses: III. A Further Study with Special Reference to Effect of Alkali on the Skin, Effect of Soap on pH of Skin, Modern Cutaneous Detergents, A. M. A. Arch. Dermat. & Syph. **63**: 1 (Jan.) 1951.

DIAGNOSIS

Diagnosis of the occupational group was made after thorough history taking, complete physical examination, and acquisition of complete knowledge of the claimant's work, of technical processes, and of the nature and concentration of the substances to which he was exposed. Too frequently the claimant's word is taken as bona fide proof; information should come from a more authentic source. Knowledge of technical processes is best gained by visiting industrial plants. It is mandatory in diagnosis to know allergenic properties and primary irritant action (in what concentration) of substances used in industry and to know the cutaneous hazards of different occupations and cutaneous diseases that are distinctively of occupational origin. The general practicing physician is not qualified in this respect, nor, in my opinion, are certified dermatologists unless they have had additional training and experience.

Only brief discussion will be made of the actual causes shown in the table. A more detailed discussion may be found in a previously published article by Gross and me.[2] Primary irritants were the most frequent causal agents. The percentage incidence was 27.7%. Included in this category were not only acids, alkalis, and nonaqueous solvents but a variety of other cutaneous irritants, such as sulfur dioxide, some amines, and monomers. Of primary irritants, nonaqueous solvents were the most frequent. Such solvents were petroleum products, coal tar derivatives, alcohols, esters, and ketones. The following circumstances were most frequent in causing dermatitis. The most frequent cause was the use of a solvent as an anticorrosion oil on such parts (handled by the worker) as ball bearings and pistons or the use of a solvent (usually kerosene) to clean the article of work, or small mechanical parts, by immersion with the ungloved hands into the solvent. This was done by machinists, machine operators, and a variety of other workers. For the clean-

ing of large objects, notably printing presses, with a cloth saturated with a solvent, the worker invariably immersed the cloth by hand into the solvent.

The next most frequent cause (22.1%) was the direct or indirect result of accident or injury. Dermatitis arising from the splash of a caustic solution was placed in this category rather than in the category of lesions caused by primary irritants. All untoward cutaneous reactions and all infections resulting from accident and injury were likewise included in this group, rather than classified under the heading of dermatoses with physical or biological causes—for example, alopecia areata, herpes zoster, anthrax, erysipeloid, sporotrichosis, and local as well as systemic reactions to medicaments used in treatment of an injury. The latter group included, for example, untoward reactions to penicillin and sensitization dermatitis resulting from locally applied medicaments. Conspicuous in this category was eczematous dermatitis caused by an occlusive dressing, discharge, or adhesive plaster or initiated by a wound, burn, or injudicious treatment. There are a number of varied cutaneous reactions as sequelae of accident and injury, such as localization of a systemic infection—syphilis at site of injury—and of other pathological processes, to wit, the localized form of scleroderma. Doubtless, by reason of the previously mentioned methods of classification, accident and injury are a conspicuous cause of occupational dermatoses in this series.

The third most frequent cause was sensitizing substances causing allergic dermatitis. This represented 15.2% of the total number of cases. To properly discuss this phase, it would be necessary to speak in terms of industries and occupations, since sensitizing substances are so varied and usually inherent to a particular industry. To mention some industries I would especially include those engaged in manufacturing plastics, entailing exposure to a variety of monomers; those manufacturing rubber, dyes, and insecticides; and a number of other industries in which compounds of chromium and nickel are used.

The fourth most frequent cause was wet work: water alone, soap and water, and alkaline salt detergents. The percentage incidence of this cause was 15.0. Water is essential to most industries. Therefore, not uncommonly the hands and forearms of many workers are wet throughout the work day from contact with insoluble cutting oil (soup) or contact with water in tanneries, dye houses, paper mills, hat factories, or abattoirs and in work concerned with the processing, preparation of, and sale of food and beverages. Included in the wet work category were workers exposed to soap and water, soap powder, and other cleaning compounds containing alkaline salt detergents. These workers were barbers, beauty parlor operators, kitchen workers, soda fountain and lunch counter clerks, porters, janitors, scrubwomen, and other workers who cleanse a variety of objects.

Cleansing agents applied to the skin were the fifth most frequent cause. This was operative in 9.9% of the total number of cases. The predominating cause of dermatitis in this category was a variety of solvents used as hand cleansers. For this purpose the worker employs any solvent that is used at his place of work. Painters use turpentine and paint thinner; machinists use kerosene or gasoline, (fig. 1); and printers use type wash—a low boiling-range petroleum solvent. A variety of other occupations were represented in which workers remove such material as ink, tar, glue, gum, cement (used as a cohesive), and other mucilaginous and viscous substances, grease and oily materials, stain, lacquer, and varnish.

Occupational folliculitis represented 7.6% of the occupational dermatoses comprising this series. This was predominately caused by mineral oil–insoluble cutting oil. Other agents were hydrochlorinated hydrocarbons (causing so-called chloracne), tar, pitch, and a variety of fine particles such as sugar, flour, clay, cement, and dust. Physical and biological agents were operative in 2.3% of the total cases. Cutaneous reaction to spun glass, asbestos, ultraviolet light, and bites of different insects is, for example, representative of this group.

PATCH TESTS

Improperly interpreted patch test has been, in my experience, a frequent cause of erroneous diagnosis of occupational dermatitis. In discussion of patch test it is

Fig. 1.—Patient used gasoline for four years as hand cleanser and discontinued use after first occurrence of dermatitis. For ensuing 14 years hands intermittently contacted mineral seal oil (boiling range higher than kerosene). Dermatitis recurred at long intervals with increasing periods of recovery (nine weeks for last attack). Ten months after recovery from outbreak shown in figure and retirement, he remained well; patch tests then showed, in contrast to prior tests, low threshold of cutaneous irritability.

pertinent to discuss terms. Dermatosis is any disease or pathological condition of the skin. Dermatitis is an inflammatory disease of the skin (subcategory of dermatosis). Eczematous dermatitis is an inflammation of the skin that resembles eczema. The word eczema usually connotes an endogenous cause, in contrast to contact dermatitis, which is of external cause. Contact dermatitis is manifested as eczematous dermatitis and arises from a contactant cause: (*a*) a primary cutaneous irritant or (*b*) an allergenic substance. A primary cutaneous irritant is a substance in that concentration and period of exposure that produces a cutaneous reaction. There are weak and strong irritants. A strong irritant—a caustic substance—produces a burn, in contrast to eczematous dermatitis caused by a weak irritant more likely after repeated exposure.

In between high and lower concentrations of a primary irritant, there is a borderline concentration that yields variable results in patch test. This reflects the variation in irritability (reactivity) of the normal skin.

A low threshold of irritability characterizes what may be termed a sensitive skin, in contrast to a high threshold of irritability that characterizes what may be termed a tough skin. These borderline concentrations are more likely to show uniform positive reaction on the uninvolved skin of patients with eczematous dermatitis (of endogenous cause) in relation to degree and extent of involvement.

It is well known that the eczematized skin has a low threshold of irritability. It is an expression of what is called nonspecific (nonallergic) polyvalent sensitivity. This can be demonstrated by patch test with a variety of substances in that concentration (borderline concentration) to which the normal skin (with high threshold of irritability) does not react—for example, 0.5% solution of dichromate, 50% turpentine in olive oil, 5% solution

Fig. 2.—Cross sensitization seen in patient who, when first seen, had allergic dermatitis from nylon stockings, which she stopped wearing; there was no recurrence when seen two years later, at which time she had dermatitis, as shown in figure, appearing after initial use of sunburn preventive cream that contained isobutyl *p*-aminobenzoate. Patch test with cream was positive; recovery ensued in about 12 days; and three years later she resumed wearing nylon stockings without reaction.

of formaldehyde, tincture of iodine, 5% ammoniated mercury in petrolatum, 1% ammonium fluoride, and 1% sodium arsenate. Degree of irritability of the skin can also be determined by patch test with paraffinic kerosene, the normal reaction ranging from mild redness to blister formation, and with mineral seal oil refractioned into 10% fractions, as discussed in a prior communication.[3] Nonspecific (nonallergic) polyvalent sensitivity is not to be confused with specific (allergic) sensitivity based on specific immunologic mechanism, which is discussed later. A cutaneous allergenic agent is one that does not necessarily cause cutaneous reaction on first contact but, by virtue of a specific mechanism, causes cutaneous reaction on subsequent contact in that concentration to which the normal skin does not react. This comprises what is termed specific allergic sensitivity.

Patch test is indicated in diagnosis only of sensitization (allergic) dermatitis. It becomes apparent how important is the concentration of the substance tested in order to avoid positive reaction from primary irritant action of that substance. In the event of positive reaction, this question is pertinent: Does such reaction represent a primary irritant or allergenic reaction? This would not apply if the tested substance has no inherent irritant action—rubber, tobacco, nylon, and wood. It applies to all substances having an inherent irritant action. If concentration of an irritant is highly diluted (0.01%, 0.001%) in order to definitely eliminate irritant action, such dilution may yield a negative reaction, yet the tested person may be allergic to the substance, but not in the degree represented by the dilution. In patch testing, if only one concentration of a substance that is inherently a primary irritant is employed (as is generally done) and a positive result is obtained, it is difficult to differentiate the end-point of primary irritant action from allergenic action. Question of this is pertinent if positive result of the patch test is the sole or essential evidence in diagnosis of sensitization (allergic) dermatitis. It is desirable to perform control tests on normal persons in the same manner as with the tested person. Positive control tests are suggestive of primary irritant action of the tested substance.

Patch testing with improper concentration of the tested substance causing positive reaction from primary irritant action has been, in my experience, an important pitfall in diagnosis of occupational dermatitis. To avoid this pitfall, inherent to the closed method of patch testing (covering [closing] of the tested substance at its contact with the skin with a patch of gauze or cloth, maintained usually for 24 hours), as is usually employed, the open method of testing is preferable. This method is more appropriate for all substances that are inherently primary irritants. This consists of placing on the skin the tested substance, undiluted, one to several drops, or a comparable amount if not a liquid. It is allowed to dry and left uncovered. Positive reactions constitute more valid evidence of sensitization than positive reactions with the same dilutions employed in the closed method.

Patch tests have been overemphasized and unjustifiably exploited. The idea is prevalent that these tests are a reliable means of diagnosing occupational dermatitis. All varieties of material have been brought to me for patch testing at the request of the claimant, the employer, or the insurer. Most frequently such tests were not indicated; moreover, positive reactions (from primary irritant action) would have confused the issue. It should be emphasized that patch tests are indicated only in diagnosis of sensitization dermatitis (fig. 2 and 3). In some instances the history, clinical evidence, exposure to a known allergen, or localization of the eruption makes confirmatory evidence of positive patch test unnecessary (fig. 2). In this respect, in my experience, patch tests have been of limited value in diagnosis of occupational dermatitis. It is pertinent to present the opinion of others regarding the status of patch tests in

3. Klauder, J. V., and Brill, F. A., Jr.: Correlation of Boiling Ranges of Some Petroleum Solvents with Irritant Action on Skin, Arch. Dermat. & Syph. 56: 197 (Aug.) 1947.

diagnosis. Silcock [4] writes that they are of little or no practical value. Bamber [5] asserts that patch tests are not for casual use and only an expert can make and interpret them.

NONSPECIFIC POLYVALENT SENSITIZATION

Nonspecific polyvalent sensitization has been propounded as a cause for the continuation of occupational eczematous dermatitis after cessation of exposure. Consideration of synergistic action of complex factors of metallergy or parallergy or of biotropism of Milian has has been attributed in its initiation.[6] It is difficult to assess the many hypotheses and theories on basis of experimental knowledge that lead to many shades of opinion and perhaps to confusion. There is evidence that the irritability of the skin is an expression of many inherent causes. It is difficult to state when an occupational exposure ceases to play a contributory role. Judgment of this is often a judicial one. As afore-mentioned, the skin during the acute phase of dermatitis has a low threshold of irritability; this disappears after retrogression of the acute phase. The term, status eczematous, of older writers referred to this increased irritability.

Dermatitis from brief exposure to an irritant (nonallergenic) generally is of much shorter duration than from repeated or prolonged exposure of several years' duration (fig. 1). It is believed the latter causes an exhaustion of the defensive mechanism (pertinently called, in German, Erschöpfung dermatitis). Exhaustion of the skin may be elicited by patch testing every other day for 10 or more consecutive applications to the same area with the same concentration of the tested substance. With some substances positive reactions initially appear toward the end of the total number. After a rest of several weeks reapplication elicits negative reaction. The skin becomes intolerant to the causal irritant. As later discussed, after prolonged exposure to alkali, evidence suggests that intolerance or sensitivity of the skin is monovalent.

I studied patients with dermatitis from prolonged exposure to solvents. After recovery, patch tests to determine degree of cutaneous irritability showed improvement or restoration to normal (to wit, the patient shown in fig. 1). Brocq [7] and others regard eczema not as a disease but as a special type of reaction of the skin or neurocutaneous reflex to a variety of causes in certain predisposed individuals. I believe this predisposition is to be envisaged as an inherent or constitutional state peculiar to a person and somewhat comparable to a dry or oily skin. That many elements and functions of the body play at least some role in producing the altered reaction of the human skin is apparent in Belisario's [8] enumeration of the following underlying causes: (*a*) disturbance of metabolism, (*b*) dietary disturbances, (*c*) allergy, (*d*) psychosomatic influences, (*e*) hormonal influences, (*f*) vitamins, (*g*) functional factors, (*h*) pathological factors, (*i*) focal sepsis, (*j*) bacterial flora of skin, (*k*) pathogenic organisms, and (*l*) debilitating diseases, anatomic and physiological factors including climate.

SPECIFIC (ALLERGIC) SENSITIVITY

It is generally stated that allergic cutaneous sensitivity persists for an indefinite time. Recurrence of dermatitis results after reexposure to the original substance causing sensitization or to the sensitizing principle present in other substances. For example, according to Henry (1933), the sensitizing principle of celery (causing allergic dermatitis) is the essential oil, one constituent of which is limonene, also present in oils of orange, lemon, bergamot, caraway, and dill. Recurrence of dermatitis might be explained by exposure to the latter substances. Sensitivity to a plant may also exist to other botanically related plants; for example, sensitization to poison ivy (Rhus toxicondendron) may extend to the several varieties of the Rhus family. Other instances of what is called group or cross sensitization concern chemically related compounds, for example, some compounds with a quinoline ring, nickel and cobalt, various antihistamines, and sulfonamides.

Fig. 3.—Patient, an electrician, had dermatitis of the hands, forearms, and face for two years. Its unresponsiveness to treatment, improvement when absent from work (illness, vacation) suggested occupational cause, although patch tests with all material handled gave negative results. Cause was suggested by perianal dermatitis after using a paper towel instead of toilet paper; patch test with paper towel used only at work elicited positive result. Four months was required for retrogression of chronic dermatitis of face after use of paper towel was discontinued; there was freedom of recurrence 10 years later.

Mayer [9] has shown that compounds of quinone structure possess a wide sensitization spectrum. In this sphere are substances that frequently contact the skin, for example, paraphenylenediamine, sulfonamides, azo

4. Silcock, F. A. E.: Industrial Dermatitis, Brit. M. J. **2**: 830, 1944.
5. Bamber, G.: Occupational Dermatoses, Practitioner **164**: 385, 1950.
6. Sulzberger, M. B., and Finnerud, C. W.: Industrial Dermatitis: Definitions and Criteria for Diagnosis, J. A. M. A. **111**: 1528 (Oct. 22) 1938.
7. Brocq, L.: Précis-Atlas de Pratique Dermatologioque, Paris, Gaston Doin, 1921.
8. Belisario, J. C.: The Pathogenesis of Eczema, Proceedings of the 10th International Congress of Dermatology, London. British Medical Association, 1952.
9. Mayer, R. L.: Experimental Sensitization with Food Dyes and Cross-Sensitization to Paraphenylenediamine, J. Allergy **20**: 159, 1949.

dye (believed to be concerned in sensitization to nylon stockings), picric acid, other aromatic nitro compounds, certain local anesthetics, and derivatives of *p*-aminobenzoic acid, which are frequent components of sunburn preventives, such as glycerol *p*-aminobenzoate (fig. 2).

Cross sensitization phenomena are comprehensively discussed by Baer.[10] He has shown by patch test studies that cross reactions with secondary allergens comprising chemically related compounds to the primary allergen are not uniform for all patients. Each patient develops his own pattern of cross sensitization. The stronger the hypersensitivity to the primary allergen, the greater the tendency to cross sensitization. Repeated exposure to the primary allergen not only is likely to increase, rather than decrease, the degree of sensitivity to the primary allergen itself but also, in all probability, will tend to widen the pattern of cross sensitization.

Other than through cross sensitization, it is not clearly established that cutaneous allergic sensitivity predisposes to sensitivity to unrelated substances. For example, a florist, sensitized to Chrysanthemum and to one or more of its botanical species including pyrethrum (the dried flower head of Chrysanthemum cinerarioefolium), an insecticide, would not, if he changed occupation, be predisposed to sensitization to monomers in the making of plastics. If a woman employee processing carrots (an allergenic vegetable) developed a cutaneous allergic sensitivity to carrots (family, Umbelliferae), she would not be predisposed to sensitization to nailpolish, to Rhus toxicondendron or paraphenylenediamine (in hair dye), or to other allergens encountered as an industrial worker, with the possible exception of other vegetables in the Umbelliferae family. To my knowledge cross sensitization to other vegetables in this family (anise, fennel, caraway, coriander, dill, parsnip, turnip-rooted celery [celeriac]) has not been reported. The chemical nature of the sensitizing principle of carrots is not known. The known constituents of carrot oil are pinene, terpineol, and cineol. Cross sensitization may concern these constituents.

DESENSITIZATION OR HARDENING

Schwartz notably champions the opinion that workers with an allergic dermatitis may become desensitized if exposure to the allergen is continued. He believes this more likely occurs if dermatitis ensues after short exposure than after prolonged exposure and less likely occurs after severe dermatitis, necessitating layoff from work. Goldsmith and Hellier [11] are of the opinion that not all workers become desensitized; it is induced more readily by some irritants, e. g., tetryl, than others, e. g., chromates, and it is probably impossible to produce it with some substances. I do not believe this concept of desensitization is universally accepted. It may find some support in the common experience of dermatitis appearing after more than usual exposure to the causal agent and its initial occurrence on resuming work after absence. I have observed this from exposure to weak primary irritants as well as allergenic substances.

10. Baer, R. L.: Cross-Sensitization Phenomena, in Modern Trends in Dermatology (Second Series), MacKenna, R. M. B., editor, New York, Paul B. Hoeber, Inc., 1954, p. 232.

11. Goldsmith, W. N., and Hellier, F. F.: Recent Advances in Dermatology, ed. 2, London, J. & A. Churchill, Ltd., 1954, p. 322.

PROGNOSIS

It would be desirable to discuss prognosis of occupational dermatoses in relation to each causal group (table). Prognosis is different for the varied cutaneous diseases in the trauma and accidental group. Infections represented in this group, to wit, erysipeloid and anthrax, may result fatally (although less likely now with antibiotic therapy); inoculation tuberculosis at site of injury may extend beyond the primary cutaneous lesion. Herpes zoster ophthalmicus resulting from injury may eventuate in loss of, or impaired, visual acuity. Occupational cancer (not included in table) may cause death. Discussion of prognosis will be confined to eczematous dermatitis of occupational origin and will comprise experience of such cases included in the 2,407 cases.

Of occupational dermatoses, the predominating pattern of eruption is eczematous dermatitis, or occupational dermatitis, as shown in figure 1. There are fewer diseases of the skin of occupational causation with other patterns of eruption than the many occupational causes of eczematous dermatitis. Reference is made, for example, to chloracne, oil folliculitis, melanosis, milkers' nodule, erysipeloid, anthrax, beryllium granuloma, chrome ulcer, "grain itch," and "copra itch."

In discussion of prognosis, it is to be noted that the common diseases of the skin, those that may result fatally, pursue a chronic course, or be characterized by recurrences, are not of occupational origin. Reference is made to pemphigus vulgaris (not including "butchers pemphigus" that may arise out of occupational injury; the consensus is that this disease is not true pemphigus but is a bacillary infection), lupus erythematosus, the lymphoblastomas, lichen planus, psoriasis, dermatitis herpetiformis, atopic dermatitis, and seborrheic dermatitis.

Sensitization Dermatitis (Allergic Dermatitis).—Sensitization dermatitis progressively improves and disappears after cessation of exposure to the allergenic agent and its secondary allergens, if cross sensitization is involved. If sensitization dermatitis (uncomplicated) does not disappear after exposure ceases and cross sensitization phenomenon cannot be shown, I believe it questions diagnosis and calls for reexamination of the evidence. The hypothesis expressed by "broadening of the allergic base" is given to explain persistence of an allergic dermatitis through acquisition of new sensitizations. Proof of the specific allergens should be demonstrated to validly explain continuation of the dermatitis.

Of patients with allergic dermatitis in this series, period of disability was limited. Mild and localized dermatitis disappeared after exposure ceased in as short a period as one week (fig. 2). Prolonged and repeated exposure to the allergen after onset of dermatitis causing chronic dermatitis may require weeks for restoration of the skin to normal (fig. 3). Sensitization chromate dermatitis pursues a longer course to recovery after cessation of exposure than other forms of sensitization dermatitis. This did not apply, however, to cases in this series. In exceptional cases, recovery ensued in about eight weeks.

As a rule, I advise workers with allergic dermatitis to change to work entailing no exposure to the allergen or, in selective cases, to continue the same work employing protective measures. High degree of sensitivity requires avoidance of remote exposure. A painter, for example, may be so allergic to turpentine (although this is rare) that passing through a freshly painted room causes cutaneous reaction. On the other hand, low degree of sensitivity may permit a working tolerance with protective measures, especially the use of gloves.

Miescher [12] reexamined 86 patients with sensitization dermatitis two to three and one-half years after cessation of exposure to the allergenic agent. Sixty-nine per cent showed negative results of patch test; the remaining showed a diminished or unchanged reaction. Of patients who continued their exposure, 5% showed negative results and 10% a diminished reaction, and for 85% the reaction was either unchanged or increased. Of patients no longer exposed, 91% remained free of dermatitis, but only 26% of those who continued their exposure (using gloves and other protective measures) remained free of dermatitis. Miescher expressed the opinion that allergic cutaneous sensitivity is not a fixed quality and, in the absence of further exposure, its duration might be limited.

Comparable results were obtained by Gomez-Orbaneja and Barrientos,[13] who examined 106 patients with occupational dermatitis one to three and a half years after treatment. When the causal agent, chiefly turpentine, was eliminated, the patient remained free of dermatitis and the hypersensitivity was, in most cases, greatly diminished or no longer present. Morgan [14] studied 54 patients with proved nickel sensitivity 1½ to 11 years previously. Thirty-one patients showed persisting sensitivity, and 23 gave negative patch tests, although 18 of these 23 patients still had dermatitis. He expressed the opinion that sensitivity to nickel might be regarded as a transitory phase in the course of a series of eczematous reactions.

Nonsensitization Dermatitis.—Nonsensitization dermatitis tends to disappear after proper treatment and avoidance of the occupational cause. I am in agreement with Bamber [5] who writes: "After adequate treatment and absence of work the great majority of patients suffering with occupational dermatitis recover completely." Mayr [15] followed up 301 patients with occupational eczematous dermatitis, caused chiefly by primary irritants and not by allergic sensitivity. After three years, 30% were cured and had resumed their former work without recurrence; after 10 years the percentage rose to 68. He, therefore, observed a tendency for the sensitivity of the skin to abate, though often only after a series of relapses of diminishing severity.

Burckhardt [16] studied the capacity of the skin to neutralize alkali. He attributes impairment of this function as the prime etiological factor in dermatitis after prolonged exposure to alkali, such as soap solution and cement. Burckhardt reexamined 68 patients who had lowered alkali neutralizing capacity 2 to 12 years after initial examination. Eighteen patients showed some degree of recovery; for the remaining number no change was observed. Of 17 patients studied by Schmid (1952), no improvement was noted after disappearance of dermatitis. On the other hand, in the study of Meyer and Economopoulos (1950), alkali neutralization tests returned to normal at time of disappearance of dermatitis.

In many instances of eczematous dermatitis, I envisage the exposure (occupational and nonoccupational) that initiated the dermatitis as an aggravating agent of an inherent predisposition to eczematization. This can be illustrated in the following manner: A person with eczema (true endogenous eczema) of the hands uses gasoline as a hand cleanser; this aggravates the eczematous dermatitis. This effect disappears; the eczema continues. Eventually, recovery ensues; gasoline is again used, with the result that it causes an outbreak of eczematous dermatitis.

There are instances in which the course of occupational dermatitis is protracted, as afore-mentioned, after repeated and prolonged exposure to a primary irritant. Dermatitis of the hands may become complicated with fungus infection (dermatophytosis) secondary to infection of the feet or complicated with bacterial infection. Eczematization of an extensive scar and at sites of amputation (indirectly of occupational causation) may pursue a prolonged course. There are a number of circumstances that retard recovery of occupational dermatitis. Morris [17] discusses in detail 24 such circumstances, some of which are: failure to follow advice of treatment; overtreatment; bacterial infection; fungus (dermatophytosis) infection; exposure to causal agents outside of employment; foci of systemic infection; vitamin deficiency; psychosomatic factors; disappearance or continuance of dermatitis when it is to the financial benefit, or otherwise to the welfare, of the patient; and what he termed "magic green salve" treatment—disappearance of dermatitis after financial settlement. Another reason he enumerated, and one frequently operative in my experience, is an incorrect original diagnosis of occupational dermatitis.

PERIOD OF DISABILITY AND OF RECOVERY

Discussion of period of disability and recovery will be confined to occupational dermatitis. Of such cases in the total of 2,407 cases of occupational dermatoses, none of the patients, during my observation, had total permanent disability nor did universal involvement of the skin ensue. The following data are compiled from 300 consecutive case records. Five patients were hospitalized; 220 lost no time from work, treatment being administered during their continuance at work. Loss of work of 79 of the remaining 80 ranged as follows: less than one week, 25; 8 to 15 days, 14; 15 to 30 days, 22;

12. Miescher, G.: Katamnestische Untersuchungen bei Ekzematikern, Schweiz. med. Wchnschr. **68**: 783, 1938.

13. Gomez-Orbaneja, J., and Barrientos, E.: Funktionelle Nachuntersuchungen bei Ekzematikern, Schweiz. med. Wchnschr. **68**: 694, 1938.

14. Morgan, J. K.: Observations on the Persistence of Skin Sensitivity with Reference to Nickel Eczema, Brit. J. Dermat. **65**: 84, 1953.

15. Mayr, J.: Über das Schicksal von 300 Ekzematikern, Arch. f. Dermat. u. Syph. **177**: 83, 1938.

16. Burckhardt, W.: Cutaneous Resistance to Alkalies, in The Eczemas: A Symposium by Ten Authors, Loewenthal, L. J. A., editor, Baltimore, Williams & Wilkins Company, 1954, p. 104.

17. Morris, G. E.: "Why Doesn't the Worker's Skin Clear Up?": Analysis of Factors Complicating Industrial Dermatoses, A. M. A. Arch. Indust. Hyg. **10**: 43 (July) 1954.

five to eight weeks, 15; and three to four months, 3. Computing 30 days to a month, the total number of months these 79 patients lost from work was 61.7 months and would be less if computed in work days. (One patient had fracture of a leg and had not worked for six months; his eczematous dermatitis, an indirect result of this injury, was not incapacitating and, therefore, this patient is excluded.)

Time required for recovery in 297 cases of occupational dermatitis ranged as follows: about one week, 113; about 2 weeks, 61; 3 to 4 weeks, 77; 5 to 6 weeks, 25; 7 to 10 weeks, 13; 12 to 18 weeks, 6; and 6 to 12 months, 2. Not included in the tabulation were three patients whose eczematous dermatitis of the hands considerably improved, followed by relapse in the course of months despite treatment and cessation of occupational exposure. The latter was relatively brief and comprised solvent, wet work, and excessive hand washing. For reasons discussed, I believe it more reasonable to ascribe continuation and relapse to other processes than to original occupational exposure. Of the two patients with the longest period of recovery (6 to 12 months), the dermatitis of one patient was complicated with bacterial infection, while the other patient had recurring bouts of dermatitis of the face that were finally diagnosed as allergic reactions to phenol formaldehyde dust.

Resumption of Work.—For a considerable number of patients with occupational dermatitis, their work was changed (prior to or after recovery), which contributed to shortening the period of disability and of recovery. Change of work was usually possible if it was nonspecialized and if the patient was employed in a large plant. If specialized, some modification was frequently possible to avoid causal exposure. If change of work is not possible, or not desired, resumption of the same job without recurrence of dermatitis is facilitated by the following measures: wearing of gloves (if only part time); avoidance of solvents as hand cleansers; change in method of hand cleansing, especially use of nonsoap detergents; curtailing degree and duration of exposure that initiated dermatitis; use of barrier creams, buffer applications (especially after exposure to alkali), neutralizing applications, and emollients; attention to nonoccupational exposures; continued treatment of dermatophytosis (hands and feet); correction of faulty dietary habits, with vitamin therapy if necessary; and attention to general state of health and time allotted for sleep and rest. If the foregoing measures, especially the use of gloves in wet work (for example, beauty parlor operators or barbers), cannot be instituted, change of work is mandatory. As afore-mentioned, this generally applies to workers with allergic dermatitis.

1934 Spruce St. (3).

TECHNIQUE FOR ROUTINE PELVIMETRY WITH USE OF A SINGLE X-RAY FILM

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• A routine screening procedure is needed in the pelvimetric examination of primigravida women in order to discover all cases that deserve closer diagnostic study. The bony pelvis in the pregnant woman is not a rigid, unyielding structure, and complicated x-ray techniques of high accuracy are not essential as part of the routine examination. They should be reserved for cases in which the initial screening leaves doubt as to the functional capacity of the pelvis. The procedure here outlined consists of certain manual techniques plus a single x-ray film obtained according to the Thoms-Wilson technique. This makes it possible to separate pelves into two groups; namely, those that can be relied upon to permit passage of a normal fetus and those that should have further x-ray study before the pelvic survey can be considered complete.

Every primigravid woman should have the benefits of a survey of the capacity of her bony pelvis. Such a survey should include an assessment of the morphological characters and the important diameters of the pelvic inlet, midplane, and outlet. It is possible to do this with x-ray techniques now available to a degree of accuracy that is entirely adequate for obstetric purposes. Such an x-ray survey has been done at the university service of the Grace-New Haven Community Hospital for the past 25 years as a routine procedure on primigravid women, with use of two films, an inlet view and a lateral view, supplemented by a palpatory or clinical examination. This wide experience has not only revealed the obvious, that is, that most women have pelves that have adequate capacity for childbearing, but it has shown conclusively that palpatory methods alone cannot be relied upon for screening purposes and that subjective impressions thus obtained can be misleading. The experience has also further established the fact that midplane and outlet contraction can exist alone or can exist in combination in women with pelves that otherwise have only a normal capacity.

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WHEN X-RAY IS NECESSARY

Clinical examination alone cannot be relied upon to discover in all instances those pelves that deserve more extensive study, that is, x-ray assessment. We believe, however, that solely for screening purposes, as a routine procedure, palpatory measures plus a single x-ray film can furnish the proper information for this purpose. In

this proposed technique, the use of the lateral film, which is an essential part of our general pelvic survey, is omitted, its use being reserved for those instances (1) in which further information is desired concerning pelvic morphology, (2) in which more definite information is desired concerning anteroposterior diameters at all levels, and (3) where it is desired to study cephalopelvic relationships.

It may serve a useful purpose to review the position that pelvimetry occupies in obstetric prognosis. Pelvimetric findings must always be related to other factors in parturition that are not so readily measured, namely, the force and character of the muscular contractions, the size and moldability of the fetal head, dilatability of the soft parts, the "give" of the pelvic joints, and the attitude of the patient; to these sometimes might be added the patience of the obstetrician. Of all these other factors, the give or mobility of the pelvic joints has the most direct relationship to pelvimetry. Such mobility is considerably influenced by posture, and, while it is doubtful that posture in itself affects to any noticeable degree pelvic relationships at the pelvic inlet, under its influence the mobility of the lower sacrum can affect capacity in the lower pelvis to an extent that is not to be minimized.

All the pelvic joints show increased relaxation under the influence of pregnancy. As one of us showed in a previous x-ray study of 100 primigravid women,[1] relaxation of the symphysis pubis is a progressive phenomenon and rarely may be such as to not only increase capacity at the outlet markedly but interfere with locomotion. The influence of posture on outlet capacity referred to has been known for a long time. Some years ago one of us,[2] in a study of 500 women who were pregnant, showed that the effect of the exaggerated lithotomy position over the usual obstetric posture was to increase the anteroposterior diameter of the outlet 1.0 cm. or more in 80% of the women studied, and in 20% this increase was 1.75 cm. or greater.

SIMPLE X-RAY TECHNIQUE ADEQUATE

These and other supporting facts concerning pelvic mobility in pregnant women deserve consideration when assessing pelvic capacity and point out again that a reasonable accuracy in pelvimetric techniques is all that is essential for obstetric purposes. Complicated x-ray techniques striving to be accurate to the last millimeter have no advantage over simpler methods that are but reasonably accurate. The bony pelvis in the pregnant woman is not a rigid, unyielding structure, the functional capacity of which is to be assessed solely by precision methods.

In the routine screening plan here proposed, the following information is obtained: for the pelvic inlet: (1) morphological aspects, (2) anteroposterior diameter, (3) transverse diameter, and (4) other inlet diameters if desired; for the pelvic midplane: (1) morphology of ischial spines, and (2) transverse (interspinous) diameter; and for the pelvic outlet: (1) morphological aspects, (2) anteroposterior diameter of outlet, and (3) consideration of available anteroposterior diameter when necessary.

The inlet and midplane assessments are made on a single x-ray film obtained according to the Thoms-Wilson technique.[3] Two corrected centimeter scales appear on the film (fig. 1). The uppermost scale represents the correction for the plane of the inlet, and the lower scale represents that of a plane 7 cm. below this level, in which rest the ischial spines. Our experience has shown that correction at this 7 cm. level is sufficiently accurate for all obstetric purposes provided the target-film distance is maintained at 36 in.

MANUAL TECHNIQUES IN CLINICAL EXAMINATION

For the purpose of this screening plan, the pelvic outlet is assessed by manual techniques that include a systematic vaginal and rectal examination to determine (1) sacral contours and relationships; (2) position and mobility of the coccyx, determining also the lowest fixed segment in the sacrum or the coccyx; (3) external palpation of the pubic arch for an impression of its amplitude; and (4) determination of the anteroposterior diameter of the outlet. In considering this important diameter, Morris [4] makes this observation with regard to clinical (manual) techniques: "X-rays offer a complete range of measurements, but that clinically, although various subjective impressions may be useful in experienced hands, the only reliable measurement is the anteroposterior diameter of the plane of least pelvic dimensions," and he further states that, "with the one clinical measurement of the anteroposterior diameter of the inferior strait of the pelvis it should be possible to pick out the dangerous cases for full radiological pelvimetry."

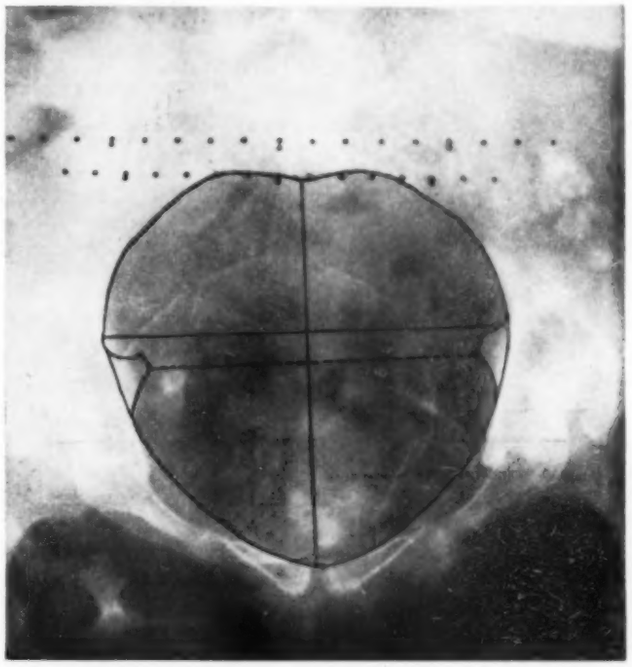

Fig. 1.—Single x-ray film with corrected centimeter scales for inlet and interspinous (midplane) levels.

1. Thoms, H.: Relaxation of the Symphysis Pubis in Pregnancy, J. A. M. A. **106**: 1364-1366 (April 18) 1936.
2. Thoms, H.: A Statistical Study of the Frequency of Funnel Pelvis and the Description of a New Outlet Pelvimeter, Am. J. Obst. **72**: 121-132, 1915.
3. Thoms, H., and Wilson, H. M.: The Roentgenological Survey of the Pelvis, Yale J. Biol. & Med. **13**: 831-839, 1941.
4. Morris, W. I. C.: Outlet Contraction of the Pelvis, Edinburgh M. J. **54**: 90-110, 1947.

Two techniques exist for determining this diameter clinically. The measurement may be made by vaginal examination with the tip of the finger in contact with the lower edge of the lowermost fixed sacral segment (usually the tip of the sacrum) and the base of the forefinger against the lower edge of the symphysis measuring the intervening distance, as in the "diagonal conjugate" maneuver, or it can be made externally with calipers, measuring from the lower margin of the symphysis to a selected point externally at the lower end of the posterior surface of the sacrum, deducting 1 cm. to allow for the thickness of the sacrum and soft tissues. Moir [5] says that the left lateral position is useful in taking this latter measurement. In either technique, the lowest fixed sacral or coccygeal segment must be identified by vaginal or rectal examination or by vaginal examination combined with external palpation in the natal cleft. Morris [4] says that the internal measurement can be made with accuracy very close to radiological measurement, and Heyns [6]

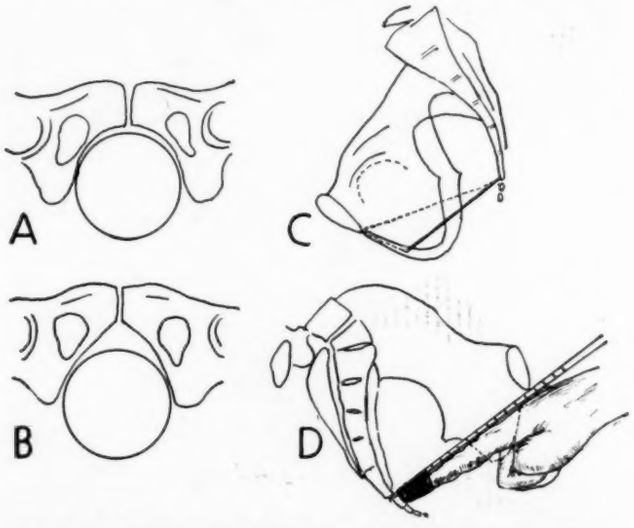

Fig. 2.—*A*, No displacement. When posterior displacement takes place as in *B*, available anteroposterior diameter (solid line, *C*) gives true index to outlet capacity. *D*, anteroposterior diameter of outlet measured externally or by "diagonal conjugate" maneuver shown here.

claims that the external measurement is at least as accurate as the x-ray measurement if deduction of 1 cm. is made for the thickness of the sacrum and soft tissues. Our own experience with the internal measurement bears out this statement.

MEASURING PELVIC OUTLET CAPACITY

In discussing the pelvic outlet in its relation to pelvic capacity, Williams and Arthure [7] state, "It is not so well recognized that outlet contraction of a sufficient degree to give rise to serious dystocia may occur in pelves which show no other abnormality and are not deformed in the true sense." Outlet contraction may manifest itself (1) as a narrowing of the anteroposterior diameter, i. e., the result of a general funnel tendency in which anteroposterior and transverse shortening are both present; (2) transversely alone by too prominent ischial spines; (3) anteroposteriorly alone by an unusual convergence forward of the lower sacrum; and (4) as a narrowing of the pelvic arch, either alone or in association with the above.

The effect of abnormal narrowing of the pelvic arch is to deny to the head anterior space in the arch, compelling the head to emerge more posteriorly, in this way impinging more deeply upon the soft tissues, causing trauma to be more common and more severe (fig. 2*A* and *B*, adapted from Morris [4]). As a result of this posterior head displacement, the true anteroposterior diameter of the outlet does not give a proper index of outlet capacity. A truer perspective is seen in the so-called available anteroposterior diameter, which is a distance extending from the apex of a hypothetical pelvic arch to the sacral tip (heavy line, fig. 2*C*). (Accurate measurement of this diameter is possible through x-ray techniques fitting a circular disk representing the average suboccipitobregmatic circumference into the shadow of the arch.) Morris calls the available anteroposterior diameter the "corrected" anteroposterior diameter and says that, when it is less than 10 cm., the outlet is contracted.

For screening purposes as to outlet contraction that is not suspected by clinical examination, we rely on the length of the true anteroposterior diameter and accept the dictum of Morris, "that if the anteroposterior diameter of the plane of least pelvic dimensions measures 11.5 centimeters or more, serious anteroposterior narrowing of the outlet can be ruled out, since in the narrowest pelvic arches the corrected (available) anteroposterior diameter very seldom differs more than 1.5 centimeters from the anteroposterior diameter of the inferior pelvic strait."

Three Groups of Pelves.—We recommend that, for screening purposes, consideration be given to our division of the usual variations into three groups, namely: (1) dolichopellic pelves, in which the length of the anteroposterior diameter of the inlet exceeds the widest transverse diameter (19% incidence in 1,100 white women); (2) mesatipellic pelves, in which the length of the anteroposterior diameter of the inlet is less than the transverse by no more than 1 cm. (46% incidence in 1,100 white women); and (3) brachypellic pelves, in which the length of the anteroposterior diameter of the inlet is from 1.1 to 3.0 cm. less than the transverse diameter (32% incidence in 1,100 white women).

Five "Key" Diameters.—For screening purposes, we have established criteria in which we recognize smallness or relative shortening in the following "key" diameters: for the inlet: (1) dolichopellic type inlet anteroposterior diameter less than 12.0 cm., (2) mesatipellic type inlet anteroposterior diameter less than 11.0 cm., and (3) brachypellic type inlet anteroposterior diameter less than 10.5 cm.; for the midplane: transverse (interspinous) diameter less than 10.0 cm.; and for the outlet: anteroposterior diameter less than 11.5 cm. (in cases of good pelvic arch amplitude, less than 11.0 cm.).

When any one or more of the five diameters is less than the measurement listed, we recommend the taking of a lateral pelvic x-ray (we use the Thoms-Wilson tech-

5: Moir, cited by Morris.[4]

6. Heyns, cited by Morris.[4]

7. Williams, E. R., and Arthure, H. G. E.: Further Radiological Studies in the Investigation of Obstetric Disproportion with Especial Reference to the Contracted Pelvic Outlet, J. Obst. & Gynaec. Brit. Emp. 56: 553-575, 1949.

nique). In certain instances after this is done, stereoscopic study may be further useful. In assessing morphological characteristics, if unusual asymmetry or abnormal narrowing of the forepelvis is present, further study is also indicated.

Palpatory Maneuvers.—In regard to palpatory maneuvers in assessing outlet capacity, we are in agreement with Kaltreider [8] that the intertuberous and posterior sagittal diameters cannot be measured accurately by clinical examination and that x-ray techniques are far more reliable in outlet mensuration. We also agree that, from a prognostic viewpoint, the anteroposterior diameter of the outlet supersedes the reliability of either the intertuberous, the posterior sagittal, or their sum, in prognosis. However, with but reasonable experience, we believe that clinical palpation of the pubic arch and the intertuberal space can give impressions that are of value.

Anteroposterior Diameter of Outlet.—We determine the anteroposterior diameter of the outlet by the "diagonal conjugate" maneuver referred to above, using a graduated metal rod with a curved tip, the rod being anchored to the examining finger by a metal band fixed to the lower part of the rod (fig. 2*D*). After identification of the lower edge of the sacral tip, the rod is attached to the examining finger and carried to the posterior end-point. The opposite end is raised to the lower edge of the symphysis, the point of contact is marked with a finger of the other hand, and the reading is made directly. A word should be said about interpreting the anteroposterior diameter on the inlet film. In some instances, the posterior end-point may not be represented by a single definitive shadow. For screening purposes, the most anterior shadow in the region of the sacral promontory is used as an end-point. Space anterior to this is available space.

CONCLUSIONS

We believe that for purposes of routine pelvimetric assessment, a screening plan makes possible the separation of pelves into two groups; namely, those pelves that have been shown to have adequate capacity for the passage of a normal-sized term fetus, and those pelves in which further x-ray study is desired to complete the pelvic survey.

333 Cedar St. (11) (Dr. Thoms).

8. Kaltreider, D. F.: The Prediction and Management of Outlet Dystocia, Am. J. Obst. & Gynec. **67**: 1049-1066, 1954.

CURRENT CONCEPTS OF CHRONIC ATTIC AND MIDDLE EAR DISEASE

NEW SURGICAL TECHNIQUE TO PRESERVE HEARING

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• Chronic inflammatory disease in the middle ear sometimes leads to retraction and perforation of the pars flaccida of the tympanum. These attic perforations, marginal in location, are more difficult to remedy than perforations of the pars tensa. The latter are characteristic of acute otitis, generally central in location, and likely to heal spontaneously in a few weeks.

Prophylaxis includes follow-up of all cases of acute otitis to make sure that treatment with sulfonamides and antibiotics is continued until the exudate in the middle ear is resolved completely. In cases of incomplete resolution or other long-standing disease resulting in marginal perforations, if there is persistent drainage with symptoms of extension to neighboring structures and evidence of cholesteatoma, surgery must be considered.

In four cases of chronic otitis persisting from 3 to 20 years there were marginal perforations. All were successfully treated by modified radical mastoidectomy with special attention to the ossicular chain. Audiograms showed that the severe hearing losses that were almost inevitable with older types of radical mastoid surgery were avoided in these cases.

Since the introduction of the sulfonamides and antibiotics, the emphasis in mastoid surgery technique has gradually shifted from the more radical, lifesaving procedures to consideration of the preservation of hearing. The former necrotic otological sequelae to scarlet fever and measles have been virtually eliminated by appropriate antibiotic therapy early in the course of these diseases. However, it seems that we are seeing more chronic attic retraction perforations secondary to incompletely resolved acute otitis media and long-standing allergic or inflammatory disturbances involving the eustachian tube and middle ear.

CENTRAL PERFORATIONS

In spite of seemingly adequate antibiotic therapy for acute suppurative otitis media, the tympanic membrane will occasionally rupture spontaneously or will need myringotomy to relieve the pain or bring down persistent temperature elevation. The majority of these perforations are central in position and heal spontaneously in a few weeks. If the perforation persists, healing can be stimulated by repeated careful chemical cautery of the perforation margin and application of a paper patch. Should this be ineffective, then a somewhat more elaborate method of closure treatment described by Derlacki [1] should be used. Even large central perforations of years' duration can be closed by this method. All evidence of middle ear suppuration should be cleared before closure treatment is started. Successful closure of a perforation improves the patient's hearing, permits

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Figures 1, 3, 4, and 5 are reprinted from Juers.[2]

Read before the Section on Laryngology, Otology and Rhinology at the 104th Annual Meeting of the American Medical Association, Atlantic City, June 8, 1955.

1. Derlacki, E. L.: Repair of Central Perforations of Tympanic Membrane, A. M. A. Arch. Otolaryng. **58**: 405-420 (Oct.) 1953.

the patient to go swimming, and lessens the tendency toward recurrent attacks of otorrhea with each respiratory infection.

The basic principles for treating persistent drainage from a central perforation consist of thoroughly cleaning the middle ear cavity, preferably with a small suction tip, inflating the eustachian tube to free it of secretion, and instilling some antibacterial preparation. In general I prefer the insufflation of Sulzberger powder (iodine and boric acid). Another satisfactory preparation for dry insufflation is 20% chloramphenicol (Chloromycetin) in boric acid powder. Cultures should be made in obstinate cases and the predominant organisms checked for antibiotic sensitivity. Systemic antibiotic therapy is infrequently necessary or helpful in chronic otitis media except in those instances in which there is a superimposed acute infection. Systemic antibiotic therapy without adequate local ear treatment is condemnable. Any

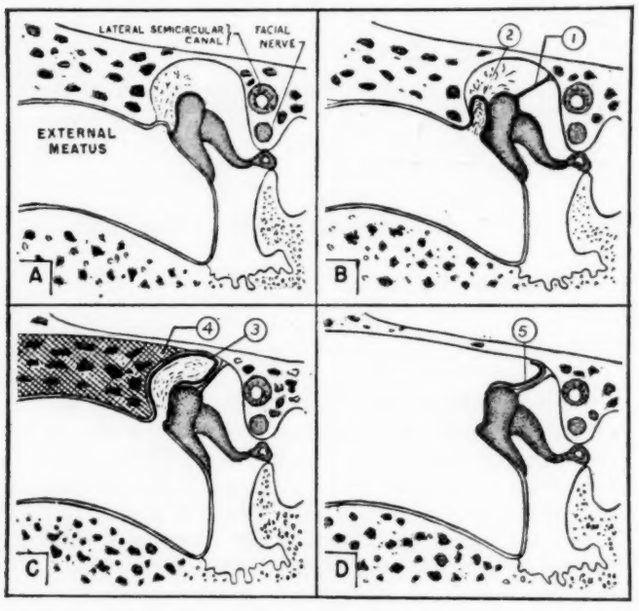

Fig. 1.—*A*, normal middle ear and external meatus. *B*, 1. Connective tissue membrane sealing off the attic from the tympanic cavity. The exact position of this membrane varies considerably. 2. Beginning retraction of Shrapnel's membrane into the attic as a result of negative pressure in the attic. Desquamated epithelium is collecting in the invaginated sac. *C*, 3. Cholesteatoma filling the attic as far as the membrane (*B*, 1). Anterior and posterior to the plane represented in this diagram the cholesteatoma usually lies against the bony labyrinth and not infrequently also against the facial nerve. In long-standing cases the cholesteatoma may invade the tympanic cavity. 4. The shaded area is the lateral attic-antral bone, which is removed in the modified radical mastoidectomy. *D*, cholesteatoma and lateral attic-antral bone removed, i. e., modified radical mastoidectomy. 5. Medial matrix remaining. If this matrix is entirely removed the tympanic cavity must be sealed off with a meatal plastic flap or skin graft.

sinus or nasopharyngeal pathology must be treated simultaneously. Often allergy contributes to chronicity.

Mastoid surgery is rarely indicated in cases of central perforation. Only when granulation or polypoid tissue cannot be controlled by conservative therapy, or if some complication seems imminent, should surgery be considered. Cholesteatoma formation is extremely rare in central perforations, but, if definite evidence of its presence is noted clinically or on x-ray, surgery is indicated.

2. Shambaugh, G., Jr.: Treatment of Chronic Suppurative Otitis Media with the Use of the Endaural Approach for Radical Mastoidectomy New Orleans M. & S. J. **94**: 105-111 (Sept.) 1941.

MARGINAL PERFORATION

Most of the chronic suppurative ear problems seen today are related to marginal perforations. These are not amenable to closure treatment. There are two general types of marginal perforations.[2] One is related to an acute necrotic otitis media and the other follows an extreme attic retraction.

Acute Necrotic Otitis Media.—New cases of acute necrotic otitis media are extremely rare today. In many of these cholesteatoma develops as a result of meatal epithelial migration into the attic. If the opening is large, cannula irrigation of the attic to remove the debris and insufflation of the previously mentioned dusting powders will, after a few treatments, usually produce a dry ear. Periodic inspection and cleaning of such an ear is necessary. Failure to obtain a dry ear after a period of conservative treatment, or suspicion of an incipient labyrinthine or intracranial complication, would indicate the advisability of considering surgery. The details of surgery will be discussed later.

Attic Retraction Perforation.—Attic retraction perforation is seen more frequently today because it is, in many instances, related to chronic allergic or inflammatory tubal obstruction and incompletely resolved recurrent acute otitis media. The process is usually initiated by the sealing off of the attic from the middle ear. As a result, negative pressure develops in the attic and the thin Shrapnel's membrane slowly retracts (fig. 1*B* and *C*). The retracted portion of the membrane may or may not actually tear. The factors that contribute to the etiology of the attic retraction perforation mechanism may be briefly listed as follows: (1) incompletely resolved middle ear mesenchyma at birth, (2) otitis media in the early weeks of life, (3) chronic allergy or inflammation of the eustachian tube and middle ear, and (4) incompletely resolved suppurative otitis media.

Figure 1*B* illustrates the retraction of Shrapnel's membrane when a connective tissue web separates the attic from the tympanic cavity. Even without actual web formation, in occasional instances, inadequate tubal ventilation may result in sufficient negative intratympanic pressure to cause retraction of, or a tear in, the thin Shrapnel's membrane. An atrophic posterosuperior quadrant of the pars tensa occasionally retracts and produces a pocket that may become infected.

The gradual accumulation of exfoliated epithelium in any attic recess represents the beginning of cholesteatoma formation (cholesteatosis). Over a period of months or years, the mass of epithelial debris enlarges and further invades the attic, mastoid antrum, and mastoid cells. This gradual extension may occur in the absence of any clinical evidence of suppuration. However, introduction of water or infection into the ear canal accelerates the enlargement of the mass and hastens manifestations of labyrinthine or intracranial extension. If erosion of the labyrinth occurs, vertigo is experienced. Extradural infection causes headache.

PROPHYLAXIS

A prophylactic approach to preventing the genesis of attic retraction is important. Chronic tubal obstruction must be thoroughly investigated. Etiological factors to

be considered are allergy, lymphoid hyperplasia, chronic nasopharyngitis, and sinusitis. Incompletely resolved suppurative otitis media may contribute to the development of attic retraction. In most of these cases there is a history of the patients having had antibiotic therapy until the acute otitis symptoms subsided but no follow-up observation to determine if the middle ear exudate resolved completely. This unresolved exudate is inclined to undergo organization that may subsequently interfere with attic ventilation and cause impairment of hearing. Inflations and sometimes myringotomy are necessary. If irreversible scar tissue seals off the attic, the stage is set for the eventual inevitable development of an attic retraction perforation.

TREATMENT

The twofold objective of treatment is, first, to eliminate the infection and pathology and, secondly, to preserve or restore hearing. In those instances in which the attic opening is relatively large in proportion to the depth of the recess, alcohol irrigation of the recess with a fine cannula and instillation of a dusting powder may produce a dry ear. This routine may have to be repeated once or twice a year. If, however, a large recess is filled with cholesteatoma and the attic opening is relatively small, constituting thereby a "bottleneck" to the egress and removal of debris, then surgical treatment is advisable. Long delay in surgical exteriorization of such lesions permits slow extension of the cholesteatoma, and, in some instances, where the tympanic cavity becomes involved, considerable loss of hearing may occur. In early cases of attic cholesteatoma the tympanic cavity is not involved and consequently there is usually good hearing.

In general, surgery should be considered in attic retraction perforation if any one or more of the following situations exists. 1. Drainage persists in spite of an adequate trial of conservative local treatment. This would apply whether or not cholesteatoma formation is suspected. 2. Cholesteatoma exists with a "bottle-neck" opening (fig. 1*C*). 3. There are symptoms of extension to contiguous structures, i. e., labyrinth, facial nerve, or dura. 4. There is x-ray evidence of large cholesteatoma.

Antibiotic therapy may alleviate to a large extent the symptoms of an impending complication; however, the underlying pathology continues to smoulder and symptoms will recur and progress more rapidly when the antibiotic therapy is discontinued.

The surgical technique applied to cases in which the disease is limited largely to the attic-antral area is usually termed a modified radical mastoidectomy (also known as the Bondy mastoidectomy or atticomastoidectomy). The details of this type of surgery have been discussed elsewhere [3] and will not be considered at length here. I prefer the Lempert [4] endaural approach rather than the old postauricular route. The main objective is to remove the lateral attic-antral bony wall so as to exteriorize and remove the disease in this area (fig. 1*C* and *D*). At the same time some form of tympanic cavity and sound conduction mechanism should be retained so that a serviceable level of hearing may be assured.

Recent observations indicate that serviceable hearing is possible even though a portion of the ossicular chain is absent.[5] Useful hearing is particularly assured if, in the absence of the incus, there is contact between the pars tensa and the stapes. I have observed a few instances in which the pathological process has destroyed the incus and simultaneously created contact between the pars tensa and the stapes with a hearing level only 20 db. below normal (case 2). If, during surgery, the elimination of the pathology necessitates removal of a well-functioning incus, better assurance of retaining useful hearing can be obtained if pars tensa-stapes contact is established at the time of surgery. I have described this technique as myringostapediopexy [5] (fig. 2).

At the time of surgery, the following situations may apply with reference to the ossicular chain as determined by preoperative hearing tests (air and bone conduction) and observations at the time of surgery. 1. An intact well-functioning ossicular chain that does not need to

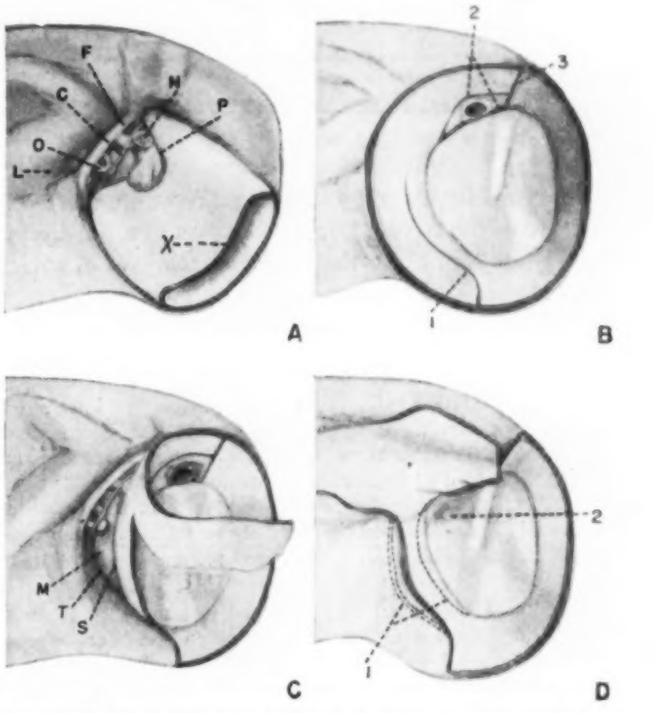

Fig. 2.—The four essential steps of myringostapediopexy. *A*, modified radical mastoidectomy completed. All attic pathology, incus, and head of the malleus have been removed. X is the cut edge of meatal skin; P, margin of attic perforation; N, cut surface of malleus neck (the head has been removed); F, facial nerve; C, chorda tympani; O, stapes; and L, lateral semicircular canal. *B*, meatal lining and position of incisions in preparation of mobilization of meatal skin flap. Incision 1 is placed several millimeters lateral to the posteroinferior insertion of the tympanic membrane. Incision 2 excises margin of the attic perforation. Incision 3 is placed superiorly to free this portion of flap. It may be placed more anterior in position if necessary to obtain a larger skin flap. C, the tympanomeatal flap freed from the posterior tympanic ring. M, is mucosa on promontory; S, posterior edge of tympanic membrane and adjacent meatal skin separated from tympanic ring; and T, posterior tympanic ring. *D*, mobilized meatal flap rotated to seal off tympanic cavity. Posterior tympanomeatal flap displaced medially from original position (1) to establish contact between pars tensa and stapes (2).

be disturbed at surgery in removing the pathology. In these cases the hearing after surgery should be equal to or better than that present before surgery (case 1). 2. Incus destroyed by disease but serviceable hearing pres-

3. Juers, A. L.: Modified Radical Mastoidectomy: Indications and Results, A. M. A. Arch. Otolaryng. **57**: 245-256 (March) 1953.

4. Lempert, J.: Lempert Endaural Subcortical Mastoidotympanectomy for the Cure of Chronic Persistent Suppurative Otitis Media, Arch. Otolaryng. **49**: 20-35 (Jan.) 1949.

5. Juers, A. L.: Preservation of Hearing in Surgery for Chronic Ear Disease: A Consideration of Factors Involved, Laryngoscope **64**: 235-251 (April) 1954.

ent before surgery because the disease process had simultaneously produced approximation of the pars tensa against the stapes. If the pars tensa-stapes contact is not disturbed, the preoperative hearing level will be retained (case 2). 3. Ankylosis of the ossicular chain with conduction deafness before surgery. Removal of the incus and malleus head can restore serviceable hearing if the stapes is mobile. Myringostapediopexy would be advisable in such cases (case 3). 4. Removal of a functioning incus is necessary in order to permit removal of cholesteatoma or other pathology medial to the ossicular chain. Myringostapediopexy is advisable (case 4).

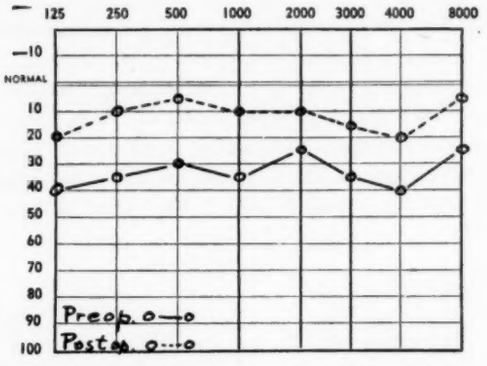

Fig. 3.—Hearing chart of patient in case 1 before and after operation.

REPORT OF CASES

Case 1.—A girl, aged 9 years, gave a history of intermittent foul drainage from the right ear since the age of 3. Examination revealed an attic perforation containing mucopurulent drainage. After a short trial of ineffective conservative treatment, a modified radical mastoidectomy was done. An attic cholesteatoma was found. The medial matrix overlying an intact ossicular chain was left in situ. The hearing improved somewhat after surgery (fig. 3).

Case 2.—A boy, aged 10 years, had had drainage from his left ear since the age of 3 months. A polyp had been removed a year before he was seen by me. Examination showed an attic perforation containing pus and cholesteatoma flakes. A modified radical mastoidectomy was performed. Cholesteatoma filled the attic, antrum, and extended into some cells toward the tip. Since there was cholesteatoma medial to the incus, all cholesteatoma matrix was removed as well as the incus. The long process of the incus was absent. The posterior portion of the pars tensa was found to be in contact with the stapes. This was not disturbed. The tympanic cavity was sealed superiorly with a small meatal skin flap. The good preoperative hearing level was preserved (fig. 4).

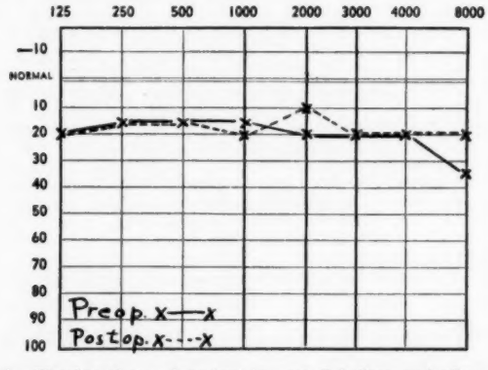

Fig. 4.—Hearing chart of patient in case 2 before and after operation.

Case 3.—A man, aged 38, gave a history of intermittent drainage from the left ear for over 20 years. Two previous simple mastoidectomies had been done with very little benefit. He had recently noted facial twitching. On examination a rather large attic perforation was noted. The pars tensa was intact. Home use of alcohol irrigations kept the drainage to a minimum. A modified radical mastoidectomy was done. A large attic recess was found to be free of cholesteatoma; however, there was some granulation tissue and pyogenic membrane in the antrum. On elevating the skin overlying the ossicles, the incudomalleal articulation was found to be ankylosed. The incus and malleus head were removed and the overlying skin replaced to seal off the tympanic cavity, which was free of disease. The patient's hearing acuity improved 35 db. to a 15 db. level (fig. 5).

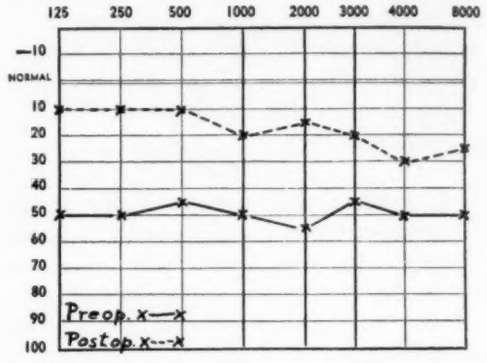

Fig. 5.—Hearing chart of patient in case 3 before and after operation.

Case 4.—A man, aged 36, had noticed pressure and intermittent drainage from his left ear for three years. On examination a small attic perforation with scant drainage was noted. Conservative treatment was ineffective. A modified radical mastoidectomy was done. Cholesteatoma and granulations extended medial to the incus. In order to remove all attic pathology, it was necessary to sacrifice the incus and malleus head. A myringostapediopexy was then carried out since the pars tensa was not in contact with the stapes. A serviceable hearing level was obtained (fig. 6).

In cases of marginal perforation secondary to an acute necrotic otitis media, there is usually considerable pathology in the tympanic cavity and, when surgery is indicated, a complete radical mastoidectomy is, in general, necessary. However, if the findings at surgery are such that the lower portion of the tympanic membrane can be safely retained and used to create an inflatable air-containing space over the round window, there is a possibility of having some useful hearing in the ear after surgery.

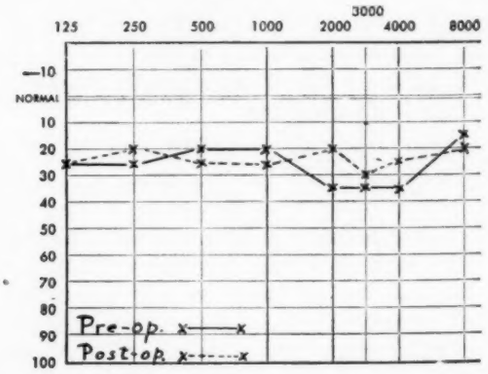

Fig. 6.—Hearing chart of patient in case 4 before and after operation.

SUMMARY

Inadequate follow-up on acute suppurative otitis media and recurring serous otitis media may result in the genesis of an attic retraction perforation with its associated irreversible pathology. Conservative management is adequate in some of the cases with less extensive attic pathology and a relatively large attic opening. When surgery is indicated, recent improvements in surgical technique and the use of antibiotics postoperatively have made it possible to give greater consideration to the preservation or restoration of hearing in mastoid surgery. If one of the ossicles needs to be sacrificed in order to remove pathology, useful hearing can be retained by approximating the pars tensa against the stapes, i. e., myringostapediopexy. Thorough preoperative evaluation of the hearing and careful observation of diseased tissues at surgery now enable the surgeon to salvage serviceable hearing in the ears of many patients who, just a decade ago would have been subjected to radical mastoid surgery with its almost inevitable 50 db. loss of hearing.

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NEUROLOGICAL AND PSYCHIATRIC SIGNS ASSOCIATED WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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and
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• Patients with systemic lupus erythematosus may suffer involvement of any part of the nervous system. It is a disseminated disease accompanied by severe manifestations of neurological and psychiatric dysfunction. This is shown by analysis of 100 clinically diagnosed cases. The neurological and the psychiatric types of manifestation can occur either alone or in combination and are of the utmost diversity. In their early stages they are liable to be misinterpreted, may lead to mistaken diagnoses, or may be falsely ascribed to cortisone therapy. The explanation probably lies in vascular changes in the blood vessels of the nervous structures.

Systemic lupus erythematosus is a disseminated disease of multiform character and unknown cause. It is found most commonly in young women but may affect persons of either sex at almost any age. Its course may be acute, subacute, or chronic. Exacerbations and remissions occur. The prognosis may be poor. Not considered necessary for the diagnosis of systemic lupus erythematosus, the so-called butterfly rash that occurs across the bridge of the nose and on the cheeks is the traditional lesion of the disease. Early symptoms of the disorder are easy fatigability, malaise, and fever. Among the most common initial signs are the migratory joint and fibrous tissue reactions that simulate those of rheumatoid arthritis or rheumatic fever. Examination often discloses anemia, lymphadenopathy, and edema. The kidneys, pleura, lungs, heart, pericardium, and gastrointestinal tract may be affected. Raynaud's phenomenon is occasionally found. Serologic reactions for syphilis may be intermittently and falsely positive. Leukopenia, a positive lupus erythematosus blood clot test, lupus erythematosus cells in the sternal marrow, and elevation of the sedimentation rate of the erythrocytes are usually present. Hebra and Kaposi [1] in the 19th century were probably the first to mention that mental disturbances are associated with lupus erythematosus. Osler [2] in 1903 noted that hemiplegia and aphasia could occur in patients with this diease. Rothman and Felsher [3] commented that patients with disease in the acute and subacute phases are restless, apprehensive, and conscious of the severity of the condition even though symptoms are few. Tumulty and Harvey,[4] Sedgwick and Von Hagen,[5] and others have reported one or several cases of lupus erythematosus showing evidence of involvement of the nervous system. Because of this recent evidence of increased interest in nervous system manifestations, it seems desirable to present the neurological and the psychiatric signs and symptoms associated with systemic lupus erythematosus as noted in a general clinic-type practice.

From the sections of neurology and psychiatry, Mayo Clinic and Mayo Foundation.

The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

1. Hebra, F., and Kaposi, M.: On Diseases of the Skin, Including the Exanthemata, translated and edited by W. Tay, London, England, the New Sydenham Society, 1875, vol. 4, pp. 14-47.
2. Osler, W.: On the Visceral Manifestations of the Erythema Group of Skin Diseases, Tr. A. Am. Physicians **18**: 599-624, 1903.
3. Rothman, S., and Felsher, Z.: Symposium on Advances in Clinical Medicine: Subacute and Acute Disseminated Lupus Erythematodes, M. Clin. North America **31**: 198-212 (Jan.) 1947.
4. Tumulty, P. A., and Harvey, A. M.: The Clinical Course of Disseminated Lupus Erythematosus: An Evaluation of Osler's Contributions, Bull. Johns Hopkins Hosp. **85**: 47-73 (July) 1949.
5. Sedgwick, R. P., and Von Hagen, K. O.: The Neurological Manifestations of Lupus Erythematosus and Periarteritis Nodosa: Report of 10 Cases, Bull. Los Angeles Neurol. Soc. **13**: 129-142 (Sept.) 1948.

MATERIAL

This report is based on a review of clinical records in 100 cases of clinically diagnosed systemic lupus erythematosus taken without selection from the files of the Mayo Clinic. The series includes those patients who were observed at this institution in the years 1948 through a part of 1951. Care was taken to exclude all cases in which systemic dissemination was not certain. Almost all of the patients in whom neurological or psychiatric dysfunction was noted had eventually been examined by a neurologist or a psychiatrist. However, most of the patients whose clinical and hospital records contained no mention of neuropsychiatric disease were not seen by the neurological and psychiatric staff. As

long-term follow-up studies could not be made in many instances, this report should not be interpreted as a statistical analysis of the incidence of the neurological and psychiatric signs and symptoms found in patients with systemic lupus erythematosus.

RESULTS

The signs or the symptoms of any neurological illness or psychiatric illness were recorded in 28 of the 100 patients at some time before or during their contact with the examiners. Manifestations of severe psychiatric dysfunction were found alone in four cases. Signs or symptoms of neurological disease occurred alone in 11 cases, and evidence of both neurological and psychiatric disease was present in 13 cases. Thus there were 24 patients in whom signs and symptoms of neurological disease were found and 17 patients in whom evidence of psychiatric dysfunction was discovered. It might be stressed at this point that onset of these neurological and psychiatric signs and symptoms was usually not associated with marked hypertension, uremia, or the last week of the patient's life.

TABLE 1.—*Neurological Signs and Symptoms in Twenty-Four Patients with Lupus Erythematosus*

Sign or Symptom	No.
Convulsions	14
Hemiplegia	4
Double vision	4
Choked disks	3
Polyneuritis	3
Subarachnoid hemorrhage	2
Nystagmus	2
Vertigo	2
Choreiform movements	2
Monoplegia	2
Paraplegia	1
Quadriplegia	1
Aphasia	1
Intention tremor	1
Neuropathy of facial nerve (Bell's palsy)	1
Cortical blindness	1
Decerebrate state	1

Table 1 demonstrates the wide variety of neurological signs and symptoms found in 24 cases of systemic lupus erythematosus. Of these 24 patients, 12 had one symptom or sign of neurological dysfunction while the other 12 had two or more. These neurological difficulties could not be considered secondary to the use of cortisone or corticotropin (ACTH) in most instances as only 3 of the 24 patients in this group were taking one of these hormonal preparations at the time of onset of their initial signs and symptoms. Another three patients of this series manifested their initial neurological dysfunction before beginning treatment with cortisone, but new neurological difficulties continued to develop after cortisone therapy was begun. Convulsions occurred in more than half of the 24 cases. In only three of these had the initial seizures begun in the last week before death. The complaint of double vision, which was mentioned by four patients, seemed to be transient but recurring in nature. Of the three patients with polyneuritis, study of two revealed signs and symptoms consistent with the syndrome of neuronitis, as well as elevation of the total protein level in the spinal fluid. Examination of the third patient demonstrated bilateral footdrop and absent muscle stretch reflexes in the lower extremities. One of the two patients who experienced what appeared to be subarachnoid hemorrhage had had hemorrhages previously in other organs of her body. Examination of her blood revealed marked thrombocytopenia. In one of the two patients with a history of vertigo, nystagmus was present when the patient was examined. While the complaint of dizziness was not uncommon in patients with systemic lupus erythematosus, closer questioning usually revealed that the patients were not complaining of true vertigo.

Diplopia, nystagmus, and intention tremor were present at examination in one case in which the patient was a girl, 13 years old. In one case the patient gave a history of transient involuntary movements that her local doctor had called "chorea" and that had occurred four years before the diagnosis of lupus erythematosus was made. In another case the patient had choreiform movements at the time of examination. One patient told of having had neuropathy of facial nerve (Bell's palsy), and the residue of a lesion of the right seventh cranial nerve was found at neurological examination. Complete blindness occurred late in the course of one case. In this case the blindness was apparently secondary to cortical disease. In one case decerebrate rigidity was present at the time of the patient's death.

As is shown in table 2, in 17 of the 100 cases studied the patient had some type of psychiatric disturbance gross enough to be worthy of mention, minor abnormalities not being included in this series. It might be emphasized that only 1 of these 17 patients included was receiving cortisone at the time of onset of her psychiatric illness. This patient, while continuing to receive cortisone intermittently, later experienced left hemiplegia, disorientation, and focal and generalized convulsions and died in decerebrate rigidity. As this patient's initial psychiatric difficulties, consisting of severe anxiety and confusion, developed during the first day of cortisone therapy, the time sequence raises a question as to the role of cortisone as a provocative agent in this particular instance. One case in which marked psychiatric disturbances were considered to be related to cortisone therapy and in which no other neuropsychiatric manifestation developed was not included in the psychiatric group of this series. Marked anxiety, deficits in memory, and ill-defined changes in personality occurred inter-

TABLE 2.—*Psychiatric Phenomena Found in Seventeen Patients with Lupus Erythematosus*

Manifestation	No.
Anxiety with personality changes and memory defects	7
Emotional lability	3
Mental deterioration	2
Depression	2
Obsessive trends	1
Paranoid reaction	1
Hallucinations with fever	1

mittently in 7 of the 17 patients. Although the state of the disease did not necessarily warrant it, some of these seven patients complained of episodes of an overwhelming feeling of impending disaster. Recovery from this state was not necessarily associated with cortisone therapy, and many of the above-mentioned features changed from day to day without appreciable change in the physical signs of the lupus erythematosus. Emotional lability was present in 3 of the 17 patients. This was evidenced by laughing or crying that was not appropriate for the occasion. Other patients exhibited mental deterioration, depression, obsessive trends, a paranoid reaction, and hallucinations with fever. Some patients became irrational, delirious, or comatose shortly before death.

COMMENT

As demonstrated by this report, clinical evidence of transient or permanent involvement of any part of the nervous system can appear during the course of systemic lupus erythematosus. While many of the neurological and psychiatric difficulties, such as paraplegia and mental deterioration, tend to be permanent in nature others, such as choreiform movements and episodes of anxiety with personality changes, may be transient in type, even in the absence of cortisone therapy. That any part of the nervous system may be involved by this disorder from a clinical standpoint is demonstrated by tables 1 and 2. Although clinical evidence of brain involvement in the form of such signs as convulsive seizures and hemiplegia is the most common nervous system finding associated with lupus erythematosus, signs and symptoms of spinal cord and peripheral nerve disease may also be present as shown by the cases of paraplegia and peripheral neuritis.

Other authors have also noted cases of nervous system involvement that, when grouped together, indicate widespread disease of the nervous system in this disorder. Russell, Haserick, and Zucker [6] have stated that in 15% of 144 cases of systemic lupus erythematosus reported in the literature since 1935 the patients had had convulsions, a figure that corresponds closely to 14% in our series. Heptinstall and Sowry [7] have noted one case of this disease in which there were manifestations of peripheral neuritis. Piper [8] has reported one case of lupus erythematosus with paralysis of the lower extremities secondary to vascular infarction of the spinal cord. The scattered neuropathological reports concerning lupus erythematosus, by Daly,[9] Malamud and Saver,[10] Heptinstall and Sowry,[7] Piper,[8] and others, support the clinical impression of widespread involvement of the nervous system by this disease. A number of patients appear to show relatively few neuropathological lesions when compared to the neurological and psychiatric manifestations present during life. However, generally speaking, the disease seems to involve, primarily, the blood vessels of the nervous structures, thus accounting for one cause of the widespread neurological and psychiatric signs and symptoms.

SUMMARY

Recorded signs or symptoms of neuropsychiatric disease were present in the clinical records of 28 of 100 cases of systemic lupus erythematosus. Seventeen of the 28 patients had evidence of psychic disturbance, and 24 had neurological dysfunction. The onset of these difficulties was usually not associated with cortisone or corticotropin therapy, uremia, hypertension, or the last week of the patient's life. From a neurological standpoint, generalized and focal convulsions, hemiplegia, double vision, choked disks, polyneuritis, subarachnoid hemorrhage, nystagmus, vertigo, choreiform movements, monoplegia, paraplegia, quadriplegia, aphasia, intention tremor, neuropathy of facial nerve (Bell's palsy), cortical blindness, and the decerebrate state were noted. Psychiatric findings associated with the disease were symptoms of anxiety associated with fear of impending disaster, personality changes, and memory defects. Other manifestations were emotional lability, mental deterioration, depression, hallucinations occurring with fever, and paranoid and obsessive reactions. Clinical evidence of transient or permanent involvement of any part of the nervous system may appear during the course of systemic lupus erythematosus.

6. Russell, P. W.; Haserick, J. R., and Zucker, E. M.: Epilepsy in Systemic Lupus Erythematosus: Effect of Cortisone and ACTH, A. M. A. Arch. Int. Med. **88**: 78-92 (July) 1951.

7. Heptinstall, R. H., and Sowry, G. S. C.: Peripheral Neuritis in Systemic Lupus Erythematosus, Brit. M. J. **1**: 525-527 (March 8) 1952.

8. Piper, P. G.: Disseminated Lupus Erythematosus with Involvement of the Spinal Cord, J. A. M. A. **153**: 215-217 (Sept. 19) 1953.

9. Daly, D.: Central Nervous System in Acute Disseminate Lupus Erythematosus, J. Nerv. & Ment. Dis. **102**: 461-465 (Nov.) 1945.

10. Malamud, N., and Saver, G.: Neuropathologic Findings in Disseminated Lupus Erythematosus, A. M. A. Arch. Neurol. & Psychiat. **71**: 723-731 (June) 1954.

Primary Aldosteronism.—The syndrome of primary aldosteronism is now firmly established. . . . The major clinical manifestations of this syndrome consist of periodic severe muscular weakness, intermittent tetany and paresthesia, polyuria and polydipsia, and hypertension. There is no edema. The characteristic biochemical alteration in the blood is comprised of hypokalemia, hypernatremia and alkalosis (elevation of pH and CO_2 combining power). Total serum calcium is normal. Hyposthenuria unresponsive to Pitressin, persistently alkaline urine, and mild proteinuria are observed. 17-hydroxycorticoids and 17-ketosteroids are consistently normal. Despite the periodic occurrence of severe muscular weakness, one is impressed with the relative lack of important symptoms at extremely low levels of serum potassium. Another striking manifestation of this syndrome is the great resistance which it offers against attempts at potassium repletion. With very large amounts of supplementary potassium, serum potassium rises, but only mildly. It is recommended that patients exhibiting such clinical and laboratory manifestations be subjected to adrenal surgery. To date, all 12 cases of which we are personally aware have disclosed an adrenal cortical adenoma at operation or at autopsy. Nine have been cured of primary aldosteronism by surgical removal of the adenoma. The other three were recognized in retrospect at autopsy. We believe, however, that in some patients with this syndrome an adenoma will not be found at operation. Under these circumstances a total or extensive subtotal adrenalectomy (pending future experience) should be performed.—Jerome W. Conn, M.D., and Lawrence H. Louis, Sc.D., Primary Aldosteronism, *Annals of Internal Medicine*, January, 1956.

ACQUIRED TORTICOLLIS IN CHILDREN AND YOUNG ADULTS

John S. Donaldson, M.D., Pittsburgh

• *The anatomy and etiology of torticollis were studied in 37 cases. Proper roentgen examination is essential; necessary views are lateral stereograms of the cervical vertebrae, with anteroposterior open-mouth views to identify the odontoid process and to show the symphysis of the mandible and the whole of the first four vertebrae.*

The two most common findings are a unilateral subluxation between vertebrae C-2 and C-3 and a rotary subluxation between the atlas and the epistropheus. The two lesions sometimes coexist. Reduction is generally easy and in one instance was spontaneous. Diagnostic roentgen examination should be carried out before treatment such as traction or manipulation is instituted. The anatomic location and age distribution of these subluxations are partly explained by the obliquity of the articular surfaces, but other factors remain to be discovered.

Although there are other causes for acquired torticollis in children and young adults, I will discuss here only those two conditions that have been termed "unilateral subluxation of the cervical vertebrae without associated fracture," as was reported by Stimson and Swenson [1] in 1935, and "rotary subluxation of the atlas," as reported by Ferguson.[2]

Stimson and Swenson have given perhaps the clearest clinical picture of unilateral subluxation of the second cervical vertebra. They have emphasized the usual slight to minimal trauma and the findings of spasm and tenderness on the long side of a torticollis as contrasted to spasm and tenderness on the short, or concave, side as occur in myositis. They also describe the limitation of motion toward the long or stretched side of the torticollis. Fifty-two out of 56 of their patients were between 10 and 29 years of age. In half these cases, the subluxation was between C-2 and C-3. The patient in figure 1 shows the characteristic appearance of this type of torticollis. I have been able to follow 37 cases of this kind, the youngest patient being 2 years old and the oldest 20. I began to wonder why this condition occurred most commonly in children and young adults and why the subluxation occurred most often between C-2 and C-3. In the series of cases I studied, 75% of the patients had a subluxation between C-2 and C-3. I wondered whether the angle of the facets had anything to do with the apparent ease of subluxation and if the angle might change with growth from a horizontal to a more vertical position. In studying the x-rays, other associated displacements occurring with this subluxation were gradually recognized.

OBSERVATIONS AND FINDINGS

In 1945, Ferguson [2] described rotary subluxation of the atlas on the axis. He demonstrated the presence of this condition by drawing straight lines from the middle of the body of the second cervical vertebra to its spine and by drawing a second line from the spine of the second segment to the symphysis of the mandible. In the absence of rotary subluxation of the atlas on the axis, these three points lie in a straight line (fig. 2). When rotary subluxation of the atlas on the axis exists, the body of the second cervical vertebra and the symphysis of the mandible fall to one side or the other of the spine of the second (fig. 3). To quote Ferguson, "In an open mouth AP view, the chin being held anteriorally, the second cervical vertebra is in the position of relative rotation and the shadow of its body falls toward one side or the other of the shadow of its spinous process while the shadow of the chin is to the opposite side." In reviewing my cases, it became evident that this condition often coexisted with a unilateral rotary subluxation between C-2 and C-3. In the latter, on one side the facet surface of one segment is displaced upward and forward on the segment below. This is best demonstrated in the lateral stereogram (fig. 4). All the films of patients in this report were made with the patients' necks extended. Townsend and Rowe [3] and Bailey [4] directed attention to the anterior displacement of each cervical vertebra with respect to the one below, which is normally present when the neck is flexed. This displacement is most marked at the level of the second and third vertebral segments. Townsend and Rowe noted that the articular facets of C-2 and C-3 lay in a relatively horizontal plane that permitted forward displacement. Confusion between rotary subluxation and normal displacement occurring with the neck in flexion is to be avoided. The presence of rotary subluxation between C-2 and C-3 and of rotary subluxation between the axis and the atlas occurring as separate entities has long been reported.

Eastwood and Jefferson [5] discussed the problem in the proceedings of the Royal Society of Medicine in 1940. S. M. Roberts,[6] in 1937, recognized that incomplete unilateral subluxation occurs without fracture and described the condition in which the articular facet on one side rides upward and forward on its mate below without slipping off. He believed that these subluxations occurred in the upper cervical spine because the articular facets became more and more vertical as they progressed caudad, so that subluxation was more common in C-1, C-2, and C-3 and fracture more common lower down.

From the Children's Hospital, University of Pittsburgh Medical Center.

Read before the Section on Orthopedic Surgery at the 104th Annual Meeting of the American Medical Association, Atlantic City, June 9, 1955.

Drawings reproduced in figures 7 and 8 are taken from Peters, K., and others: Handbuch der Anatomie des Kindes, Munich, Germany, J. F. Bergmann, 1938, vol. 2, and are used with permission of the publisher.

1. Stimson, B. B., and Swenson, P. C.: Unilateral Subluxation of the Cervical Vertebrae Without Associated Fracture, J. A. M. A. **104**: 1578 (May 4) 1935.

2. Ferguson, A. B.: Roentgen Diagnosis of the Extremities and Spine, Annals of Roentgenology, New York, Paul B. Hoeber, Inc., 1941, vol. 17.

3. Townsend, E. H., Jr., and Rowe, M. L.: Mobility of the Upper Cervical Spine in Health and Disease, Pediatrics **10**: 567 (Nov.) 1952.

4. Bailey, D. K.: Normal Cervical Spine in Infants and Children, Radiology **59**: 712 (Nov.) 1952.

5. Eastwood, W. J., and Jefferson, G.: Discussion on Fractures and Dislocation of Cervical Vertebrae, Proc. Roy. Soc. Med. **33**: 651 (Aug.) 1940.

6. Roberts, S. M.: Fractures and Dislocations of the Cervical Spine, J. Bone & Joint Surg. **19**: 199 (April) 1937.

Other writers, such as Berkheiser and Seidler,[7] Coutts,[8] and Jones,[9] have recognized these conditions, but always as separate entities. I have been unable to find any

Fig. 1.—Patient showing characteristic deformity of torticollis.

references showing that the two conditions coexisted. Patton [10] and Roberts [6] both spoke of the higher incidence in children. Roberts stated that, in the first decade of life, injury to the cervical spine usually resulted in dislocation rather than fracture. He presented graphic

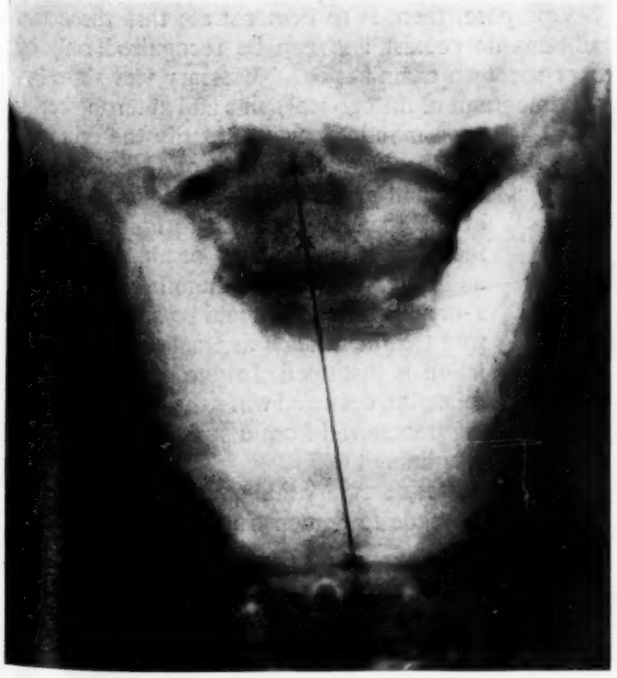

Fig. 2.—Roentgenogram of patient with torticollis without rotary subluxation of the first cervical vertebra on the second cervical vertebra, showing straight line relationship of landmarks.

demonstrations of this and showed that, after age 10, the incidence of both was about the same and that, in the older age group, the incidence of fracture was much

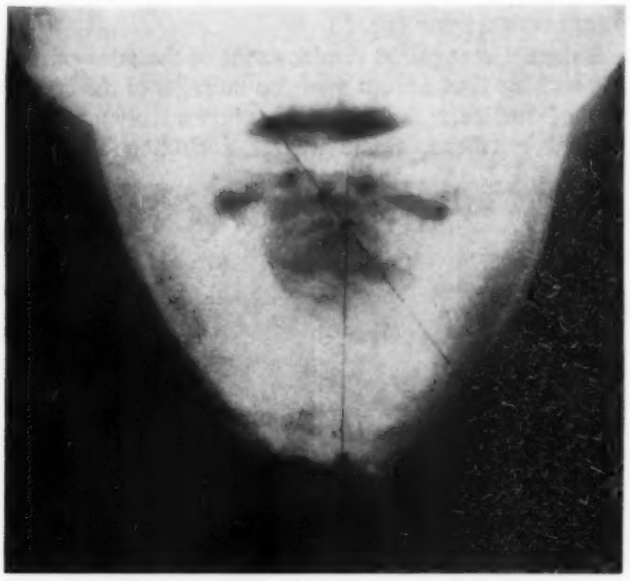

Fig. 3.—Torticollis with rotary subluxation of the first cervical vertebra on the second. Body of the second cervical vertebra lies to one side of the line drawn from its spinous process to symphysis of the mandible.

greater. He stated that the greatest number of dislocations was between C-1 and C-2, and between C-4 and C-5. In my series of subluxations, the great majority occurred between C-1 and C-2, and between C-2 and

Fig. 4.—Lateral stereogram showing facet of second cervical vertebra riding upward and forward on mate below without slipping off. This also demonstrates well the rotary effect, the sliding being on one side only.

7. Berkheiser, E. J., and Seidler, F.: Nontraumatic Dislocations of the Atlanto-Axial Joint, J. A. M. A. **96**: 517 (Feb. 14) 1931.
8. Coutts, M. B.: Atlanto-Epistropheal Subluxations, Arch. Surg. **29**: 297 (Aug.) 1934.
9. Jones, R. W.: Spontaneous Hyperaemic Dislocation of the Atlas, Proc. Roy. Soc. Med. **25**: 586 (Feb.) 1932.
10. Patton, E. F.: Cervical Vertebral Subluxation, Ann. West. Med. & Surg. **3**: 258 (July) 1949.

C-3. My roentgenograms certainly indicate that the facets in younger children are more horizontal than are those of older children. They demonstrate that, in the younger age group, the facets are more vertical in the lower cervical spine (fig. 5).

Birkett [11] recognized displacement of the atlas on the axis without fracture but made no mention of the condition of unilateral rotary subluxation involving other cervical vertebrae. Some writers, including Trivelli,[12]

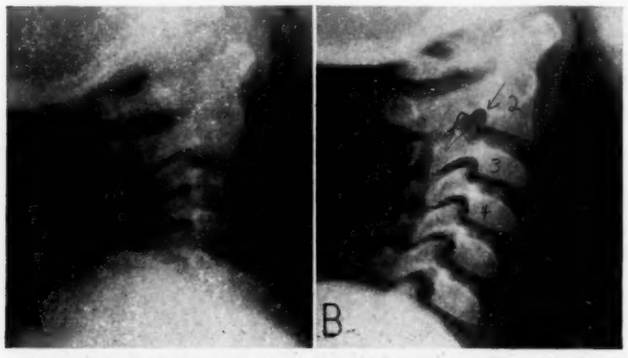

Fig. 5.—Roentgenograms of, *A*, 2-year-old patient after reduction, showing horizontal character of facets of third cervical vertebra and, *B*, 9-year-old patient, showing gradually increased slope to facets of third cervical vertebra as compared to those of the 2-year-old.

and Jacobson and Adler,[12] discussed spontaneous dislocations of this nature associated with acute infection, as for example tonsillitis. I believe that the condition is a mechanical one, that this is a concomitant occurrence, and that the subluxation probably would have occurred without infection or is incidental to minimal trauma during the infection.

It is possible that some congenital anomaly of the cervical spine renders subluxation easier. Many children play much harder and receive more severe trauma than children in the group having subluxation. The history of trauma is usually minimal, and congenital variation may permit this subluxation. One cannot fail to overlook the slope of the superior margin of the bodies of C-3 in these cases.[12a]

Nicholson [13] discusses the facet problem and goes rather extensively into the anatomy of the cervical spine.

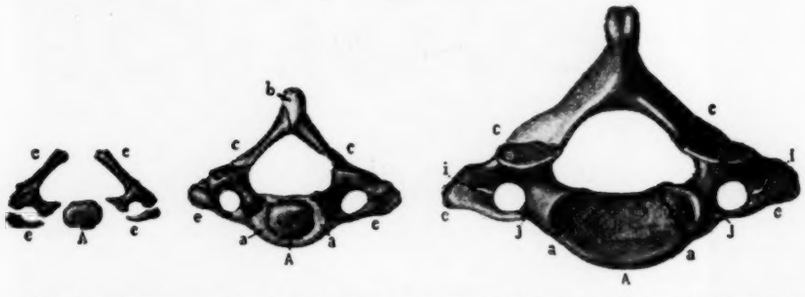

Fig. 7.—Changes occurring in third vertebra as illustrated by that of 7-month fetus, *left*; newborn infant, *center*; and 2-year-old child, *right*. Parts of cervical vertebra shown are, *A*, cervical body; *b*, spinous process; *c*, vertebral arch; *e*, costal portion; and *a*, *i*, *j*, synchondroses.

He believes that dislocation is more common in the upper two cervical segments because of the leverage of the head and the horizontal position of the facets (fig. 6). He notes that the inferior facets of the second cervical segment are relatively farther posterior than the superior facets. These are also transitional toward a lateral plane with the articular surface obliquely anterior and caudad. The corresponding facets of the third cervical vertebra have a position with the articular surface obliquely posterior and cephalad (fig. 7). Successive articulations of the lower vertebrae are more on a lateral plane.

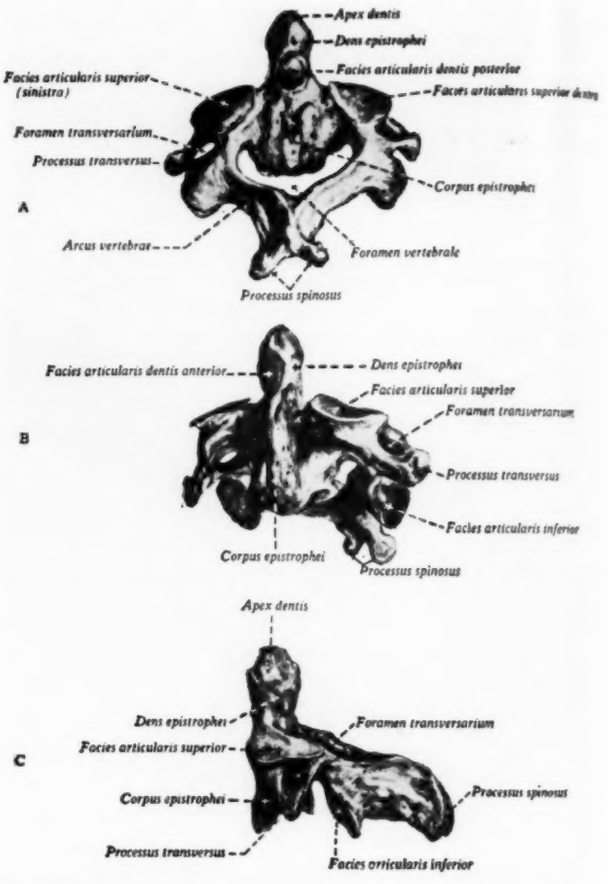

Fig. 6.—Views of second cervical vertebra, showing articular facets.

COMMENT

My purpose, then, is to demonstrate that these two conditions do coexist and can be recognized only by proper roentgen examination. Necessary views are lateral stereograms of the cervical spine and anteroposterior open mouth views to identify the odontoid together with the whole of C-1, C-2, and C-3, and preferably C-4 and the symphysis of the mandible. I wish to emphasize the fact that reduction may occur quite easily and quickly and that, therefore, diagnostic x-ray examination should be carried out before treatment such as traction or manipulation is instituted. In one of my patients, reduction occurred while the patient was being transferred from a stretcher to an x-ray examining table.

It is necessary that complete x-ray studies be made to demonstrate the possible coex-

11. Birkett, A. N.: Fractures and Dislocations of the Cervical Spine, in Modern Trends in Orthopedics, Sir Harry Platt, editor, New York, Paul B. Hoeber, Inc., 1950, pp. 293-305.

12. Trivelli, L.: Sublussazioni nel rachide cervicale consecutive a rinofaringiti acute, Minerva med. **1**: 166 (Feb.) 1947. Jacobson, G., and Adler, D. C.: Evaluation of Lateral Atlanto-Axial Displacement in Injuries of the Cervical Spine, Radiology **61**: 355 (Sept.) 1953.

12a. Badgeley, C.: Personal communication to the author.

istence of displacements between C-1 and C-2 as well as between C-2 and C-3. I also wish to emphasize the necessity for prolonged immobilization of these patients after reduction has taken place, since the pathology is undoubtedly more extensive than has been supposed. It would seem most rational that, after reduction, some form of immobilization should be carried out until the soft tissues and ligamentous structures have had sufficient time to heal. I routinely use a modified Thomas collar and believe that six weeks of immobilization after reduction by traction is adequate.

CONCLUSIONS

I have found no definite answer to the question of why torticollis occurs as a result of injury in some children and does not so occur in others. The possible existence of a common, congenital variation is being investigated. I have found that torticollis occurs most frequently in children and young adults, primarily due to the more oblique nature of the facet surfaces, which not only become more vertical with the growth of the patient but are structurally more vertical lower down in the cervical spine. I have concluded that, in patients with a clinical picture of rotary subluxation, unilateral subluxation between C-2 and C-3 may coexist with rotary subluxation of the atlas on the axis.

121 University Pl. (13).

13. Nicholson, J. T.: Spontaneous Reduction of Cervical Spine Dislocations, J. A. M. A. **115**: 2063 (Dec. 14) 1940.

CLINICAL NOTES

APLASTIC ANEMIA SECONDARY TO INTRAVENOUS THERAPY WITH RADIOGOLD

REPORT OF A CASE

Harold M. Schoolman, M.D.
and
Steven O. Schwartz, M.D., Chicago

New therapeutic agents invariably introduce new hazards. The intravenous use of radiogold (Au^{198}) is no exception. The intravenous administration of Au^{198} was the logical outcome of attempts to get the most effective doses of radioactivity to the reticuloendothelial organs, especially the liver and spleen, because of the known avidity of these tissues for gold. The purpose of this report is to call attention to deleterious consequences of the intravenous use of Au^{198}.

A 60-year-old woman was first admitted to Cook County Hospital on July 17, 1953, because of weakness and swelling of the abdomen, with pain in the left lower quadrant. She had been well until three years before admission, when the signs and symptoms of acute intestinal obstruction developed. A cecostomy was performed in November, 1950. One month later, laparotomy revealed metastatic involvement of the liver. The primary lesion, which was in the rectosigmoid, was locally resected. In March, 1951, the cecostomy was taken down. The patient had not felt well since the operations, although her appetite had been fair and she did not report a significant weight loss.

Physical Examination.—The patient was well developed. She did not appear to be in acute distress. Shotty cervical adenopathy and an enlarged liver, filling two-thirds of the abdomen, were present. The edge of the liver was blunt and firm but not tender, with a grossly nodular surface. The spleen was not palpable.

Laboratory Data.—The hemoglobin level was 11.8 gm. per 100 cc. (76%); red blood cells numbered 4,130,000 per cubic millimeter, white blood cells 5,500 per cubic millimeter, neutrophils 70, bands 1, eosinophils 3, lymphocytes 23, and monocytes 3. There was slight toxic effect to the white blood cells. Polychromasia was not seen. Urinalysis showed 1+ albumin and a trace of urobilinogen; gamma globulin level was 2.39 gm. per 100 cc., thymol turbidity 4.5 units, cephalin flocculation 0, icteric index 7, alkaline phosphatase 3.2 Bodansky units, total protein 8.1 gm. per 100 cc., albumin 4.8 gm. per 100 cc., and globulin 3.3 gm. per 100 cc. Roentgenologic studies of the upper and lower gastrointestinal tract revealed only extrinsic pressure from the enlarged liver.

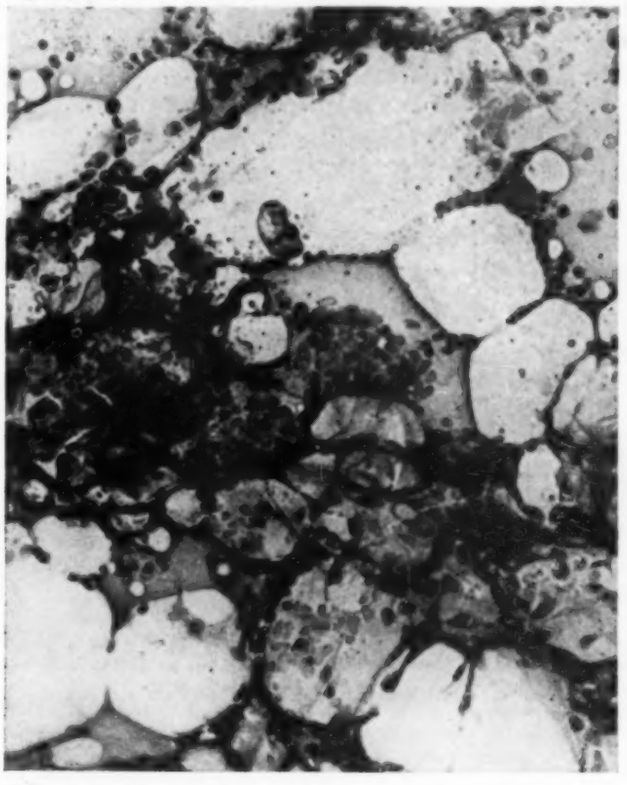

Fig. 1.—Hypocellular, fibrotic marrow with only scattered marrow remnants. Megakaryocytes were moderately decreased in number.

Diagnosis and Treatment.—The patient was referred for radiation therapy with the diagnosis of metastatic carcinoma of the liver. She received cobalt-60 radiation therapy to the liver between Aug. 7 and Oct. 28, 1953, as an outpatient. The liver was irradiated with use of the telecobalt unit (source skin distance 50 cm.) by way of four ports: (1) epigastric port, 7 by 15 cm. area, 6,262 r (air); (2) right upper quadrant port, 10 by 15 cm. area, 5,946 r (air); (3) right lateral port 10 by 15 cm. area, 5,407 r (air); (4) second right upper quadrant port, not included in port 2, 6 by 15 cm. area, 2,940 r (air). The patient tolerated this therapy well, with good subjective response. A blood cell count in December, 1953 showed 11.9 gm. per 100 cc. (77%) hemoglobin, 4,200,000 red blood cells per cubic millimeter, and 5,500 white blood cells per cubic millimeter. In January, 1954, the patient experienced gradually increasing discomfort in the abdomen, accompanied by a weight loss of 6 lb. (2.7 kg.) in six weeks. On February 15, the patient was given 50 mc. of Au^{198} intravenously.

From the Hematology Laboratory and the Hektoen Institute for Medical Research of the Cook County Hospital.

This study was aided by grants from the Olivia Sue Dvore and Edward Friedman foundations.

Readmission.—Four weeks later, on March 15, 1954, the patient was readmitted to this hospital because of progressive weakness and abdominal pains of two weeks' duration. Two days before admission, she had fainted.

Examination.—Physical observations remained essentially unchanged from the first examination except for marked pallor and tachycardia, which were now present, as well as distention of the abdomen. Analysis of the blood showed: hemoglobin 1.8 gm. per 100 cc. (12%), red blood cells 690,000 per cubic millimeter, white blood cells 800 per cubic millimeter, neutrophils 72, band cells 4, eosinophils 1, lymphocytes 17, monocytes 6. The platelets were reduced in number. The marrow was extremely hypocellular and fibrotic, with only scattered marrow remnants (fig. 1). Megakaryocytes were moderately decreased in number.

Treatment and Observation.—Apprehension and tachycardia subsided after the administration of 1,000 cc. of whole blood. During the next four months, transfusions were given as required, up to a total of 8,000 cc., in order to maintain the hemoglobin level at approximately 7.8 gm. per 100 cc. (50%). Repeated reticulocyte counts during this period were never above 1%.

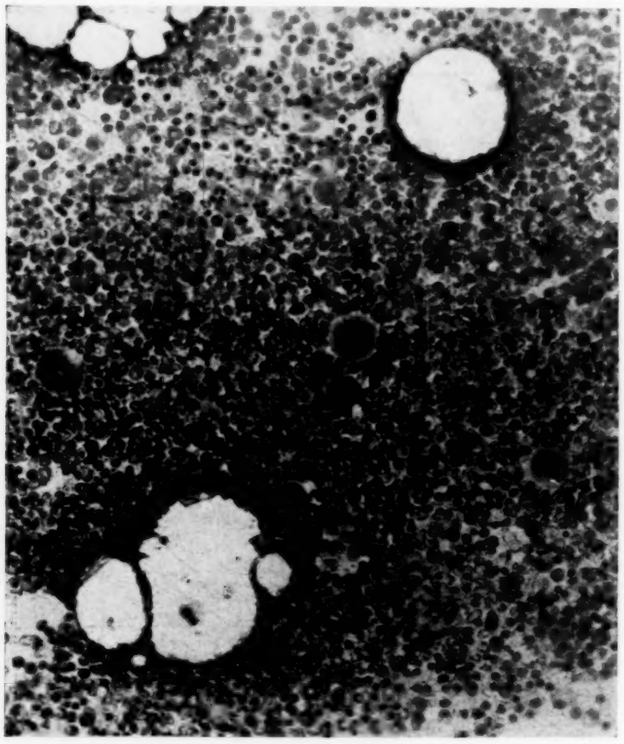

Fig. 2.—After recovery, normocellular marrow with megakaryocytes in adequate numbers.

Result of the Coombs test was negative. No significant titer of agglutinin nor hemolysin could be demonstrated in the blood. Roentgenograms still did not show any intrinsic lesions in the intestine. The patient was discharged on July 28, 1954, with a hemoglobin level of 7.7 gm. per 100 cc. (49%), red blood cells 2,560,000 per cubic millimeter, white blood cells 4,200 per cubic millimeter, neutrophils 50, band cells 3, lymphocytes 29, and monocytes 14.

During the next eight weeks, although the patient received no further transfusions, the hemoglobin level did not drop. Sternal marrow aspiration was repeated and revealed a moderately cellular marrow with adequate numbers of megakaryocytes. The nucleated red blood cell–white blood cell ratio was approximately 1:3. Erythropoiesis was normoblastic and granulopoiesis showed a slightly toxic reaction. A slight increase in lymphocytes and eosinophils was noted (fig. 2). At the patient's last visit to the clinic, on Jan. 5, 1955, approximately 11 months after Au^{198} had been administered intravenously, the hemoglobin level was 7.2 gm. per 100 cc. (46%), red blood cells 3,520,000 per cubic millimeter, and white blood cells 3,650 per cubic millimeter.

COMMENT

Information obtained from the King Daughters Hospital, Greenville, Miss., established that in 1950 the patient did have a carcinoma of the rectosigmoid that had been locally resected, and there had been gross metastatic lesions of the liver. The subsequent course was accurate as reported. It will be recalled on review that on March 15, 1954, 28 days after the patient had been given 50 mc. of Au^{198} intravenously, she had been admitted to Cook County Hospital for the second time and that the hemoglobin level was then 1.8 gm. per 100 cc. and the red blood cell count 690,000 per cubic millimeter—a drop from 11.8 gm. of hemoglobin and 4,130,000 red blood cells on first admission, July 17, 1953, and from 11.9 gm. of hemoglobin and 4,200,000 red blood cells in December, 1953, after cobalt-60 radiation therapy. On admission, sternal marrow aspiration revealed extreme hypoplasia. Hypoplasia alone, even if it had occurred on the day of administration of Au^{198}, could not account for the rapidity with which the hemoglobin level and red blood cell count fell.

Although shortened red blood cell survival time is not rare in disseminated carcinoma,[1] there is no evidence that the patient had shortened red blood cell survival before the administration of Au^{198}. The presence of hemolysins and hemagglutinins could not be demonstrated in the serum, and urine urobilinogen was not significantly increased by the time she was studied. Although radiation shortens the life span of normal erythrocytes,[2] it is not known to produce an acute hemolytic crisis. However, in this case an acute hemolytic episode must be postulated, in addition to the known marrow aplasia, to account for the precipitous fall in red blood cell count and hemoglobin levels after the administration of Au^{198}.

With regard to the marrow hypoplasia, aplastic anemia secondary to gold therapy is well documented. In 1948 FitzPatrick and Schwartz[3] reviewed the literature and added 2 cases, making a total of 20 reported cases at that time. They found no correlation between the amount of gold administered and the severity of the suppression of the marrow. This they understood to be evidence for, but not proof of, the suggestion that sensitivity rather than direct toxicity is the responsible mechanism. Calculation reveals, however, that the actual amount of colloidal gold injected in the patient whose case is reported here was approximately 0.00004 mg. This is less than one-ten thousandth of the smallest dose of gold heretofore reported to have produced aplastic anemia. It seems too remote a possibility that aplasia of the marrow in our case was due to gold per se, even on a sensitivity basis.

The patient under discussion was among the first treated with intravenously given Au^{198} in the Cook County Hospital radiation center. It was recognized at the time that the dose administered was probably high; however, because of the apparently hopeless nature of

1. Hyman, G. A.: Studies on Anemia of Disseminated Malignant Neoplastic Disease: I. The Hemolytic Factor, Blood **9**: 911, 1954.

2. Schwartz, S., and others: Studies on the Hemolytic Effect of Radiation, MDDC 1324, Report CH-3760, U. S. Atomic Energy Commission, 1946.

3. FitzPatrick, W. J., and Schwartz, S. O.: Aplastic Anemia: Secondary to Gold Therapy, Blood **3**: 192, 1948.

the disease, it seemed justified to attempt therapy to the limit of the patient's tolerance. Sheppard and others [4] have demonstrated in both human beings and animals that the amount of effective radiation delivered by intravenously given Au^{198} to the marrow is small when compared to the amount delivered to the liver and spleen. With counts per gram of heart muscle used as unity, they found that the liver and spleen accounted for the uptake of most of the administered radioactivity. All other organs, including the marrow, were low. These results, however, are based on only a few observations. There is a hundredfold variation in this small sampling of marrows, but even the maximally observed values are low. On the other hand, Root and associates [5] estimate that the concentration of Au^{198} in the marrow in human subjects may approach that in the spleen. This concentration was estimated at from 5 to 16% of the given dose. They point out that radioautographs of femurs show patchy, uneven distribution of the isotope, with most activity in areas of active cellular marrow.

Although it is apparent that any accurate quantitative estimation of the amount of effective radiation delivered to the marrow is impossible, it is equally apparent that significant concentration of the isotope in the marrow, and especially in uninvolved proliferating marrow, is to be anticipated. It may indeed be that the tolerance of the marrow more than of any other organ may be the limiting factor of the dose of Au^{198} that may be administered. What constitutes the tolerance dose of any given marrow remains unknown.

The half-life of Au^{198} is 2.69 days. This short half-life undoubtedly explains the recovery of the marrow. Certainly one may justifiably assume that had the marrow been exposed to effective radiation for any longer period, the chances of recovery would have been correspondingly reduced. It is obvious that the implied relationship between toxicity and the half-life of the agent must be an important consideration in the choice of radioactive agents for intravenous administration.

SUMMARY

Aplastic anemia occurred after the administration of radiogold (Au^{198}) intravenously for a metastatic carcinoma of the liver. This was complicated by a severe hemolytic component due to the effect of the radioactivity. The recovery of the patient's marrow is related to the short half-life of the radioactive gold.

1835 W. Harrison St. (12) (Dr. Schwartz).

4. Sheppard, C. W.; Wells, E. B.; Hahn, P. F., and Goodell, J. P. B.: Studies of the Distribution of Intravenously Administered Colloidal Sols of Manganese Dioxide and Gold in Human Beings and Dogs Using Radioactive Isotopes, J. Lab. & Clin. Med. **32**: 274, 1947.

5. Root, S. W.; Andrews, G. A.; Kniseley, R. M., and Tyor, M. P.: The Distribution and Radiation Effects of Intravenously Administered Colloidal Au.198 in Man, Cancer **7**: 856, 1954.

Cigarette Smoke.—"Cigarettes" made entirely of paper when burnt in a smoking machine give rise to smoke containing the polycyclic hydrocarbons, anthracene, pyrene, fluoranthene, 3:4-benzpyrene, 1:12-benzperylene, acenaphthylene and phenanthrene. The quantities of these hydrocarbons are far too small to account for the amounts found in the main stream smoke of a cigarette and it has been computed that the tobacco is the main source of such compounds.—R. L. Cooper, J. A. S. Gilbert, and A. J. Lindsey, Polycyclic Hydrocarbons in Cigarette Smoke: The Contribution Made by the Paper, *British Journal of Cancer*, September, 1955.

CHOLECYSTOGASTRIC FISTULA

REPORT OF A CASE

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and
Morris L. Parker, M.D., Chicago

Of all the types of spontaneous fistulas reported, the cholecystogastric is one of the most infrequent. The case herein presented is one in which the presence of a gallstone in the stomach was diagnosed preoperatively by radiological examination. A review of the literature indicates the most frequent type of biliary fistula is the cholecystoduodenal,[1] followed by the cholecystocolic fistula. Among the infrequent forms of biliary fistulas are the choledochoduodenal, choledochocolic, cholecystojejunal, and cholecystogastric.[2] Although the diagnosis is most often made at postmortem examination, the roentgen diagnosis of a biliary fistula can frequently be made, as illustrated in the following case.

A 54-year-old white male was admitted to the Michael Reese Hospital, Chicago, on Sept. 25, 1954, with complaints of vomiting and tarry stools of several days' duration. The vomiting was preceded by a short period of nausea. The vomitus was bile-stained and consisted of partially digested food particles. There had been no abdominal pain or distention prior to the period of vomiting. After the onset of vomiting, the patient had a tar-colored stool. He did not recall any previous episodes of tarry stools. The patient recalled that for several weeks prior to this admission his appetite had been poor. He had had frequent episodes of belching and epigastric burning for several days. There was no history of jaundice.

History.—For several years there had been transient periods of dyspepsia that were relieved by removing fatty substances from his diet. The patient also obtained relief through the use of alkalies. In October, 1953, approximately 11 months prior to this admission, the patient was admitted to another hospital with the symptoms of acute lower abdominal pain and intermittent vomiting. Surgery was performed, an area of regional ileitis was found, and a local resection of the intestine was carried out. Following the operation, the patient developed several fistulas along the site of incision. The patient was first admitted to Michael Reese Hospital in March, 1954, six months prior to the present admission, for repair of the fecal fistulas. At this time an upper gastrointestinal tract study by a barium meal disclosed a normal esophagus, stomach, duodenum, and small intestine. A high position of the ileocecal communication was noted and thought to be a result of the surgery. The presence of a large lamellated calcific density was incidentally noted in the right upper quadrant and thought to represent a gallstone (fig. 1). The patient was asymptomatic at the time of discharge from the hospital, and the fecal fistulas were completely closed following surgery. In July, 1954, approximately four months later, the patient experienced sharp pain in the right upper quadrant that was aggravated by respiration. Following approximately one week of discomfort, the pain disappeared spontaneously. The patient attributed these symptoms to a pleuritic attack and sought no medical aid.

Physical Examination.—The patient was a rather thin white male in no acute distress. The liver was palpable immediately below the costal margin and was not tender. A large palpable

From the departments of diagnostic roentgenology and surgery, Michael Reese Hospital.

1. Riesser, J. F., and Vicas, B.: Gallstone Impacted in the Duodenal Cap, Radiology **58**: 401-404 (March) 1952.

2. Borman, C. N., and Rigler, L. G.: Spontaneous Internal Biliary Fistula and Gallstone Obstruction, with Particular Reference to Roentgenologic Diagnosis, Surgery **1**: 349-378 (March) 1937. Byrne, J. J.: Biliary Fistulas, Am. J. Surg. **86**: 181-187 (Aug.) 1953. Epperson, D. P., and Walters, W.: Spontaneous Internal Biliary Fistulas, Proc. Staff Meet., Mayo Clin. **28**: 353-360 (July 1) 1953.

mass was found in the left upper quadrant and was interpreted as a dilated stomach containing fluid. The intestine sounds were normal.

Laboratory Examinations.—The hemoglobin level and red blood cell count were normal. The white blood cell count was 6,800 per cubic millimeter. Differential count showed a slight elevation in the neutrophil fraction. The hematocrit was 45, and

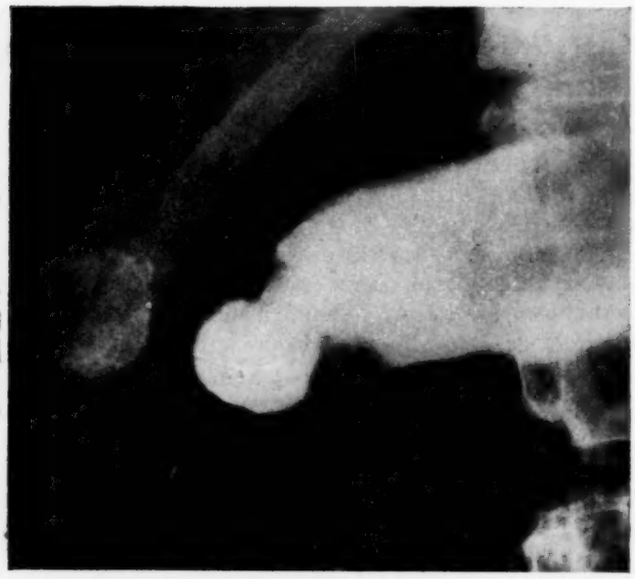

Fig. 1.—Radiograph taken in March, 1954, showing lamellated gallstone to right of barium-filled stomach and duodenum.

the serum chloride level was 82 mEq. per liter. Carbon dioxide combining power was 37.5 mm. per liter. The serum potassium level was 3.19 mEq. per liter. Urine studies were negative for albumin, sugar, and blood cells. Episodes of vomiting of bile-stained fluid and undigested food continued during the first 12 hours after admission. A Levin tube connected to a suction apparatus was then passed into the stomach and left in place. Bile-stained gastric contents were aspirated, and fluids were administered intravenously. The provisional diagnosis before roentgen study was high jejunal obstruction probably secondary to adhe-

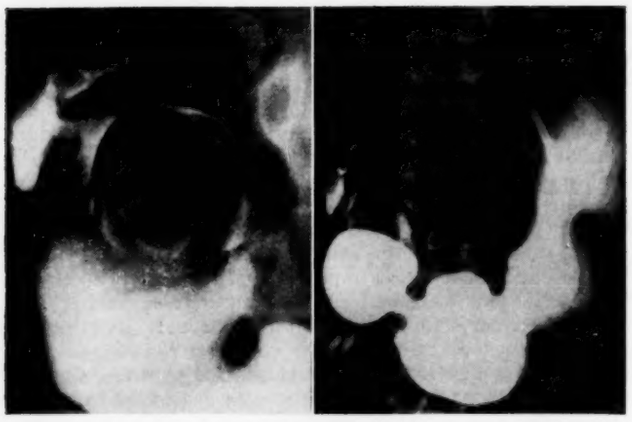

Fig. 2.—*Left*, spot radiograph taken Sept. 27, 1954, showing filling defect in the distal portion of the stomach. The gallbladder and a fistulous tract to the stomach are filled with barium. The presence of gas and barium are noted in the biliary ducts. *Right*, radiograph taken on Sept. 27, 1954, in the posteroanterior projection showing a radiolucent defect in the distal portion of the stomach. Gallbladder and biliary ducts are outlined with gas and barium.

sions. Radiological examination of the upper gastrointestinal tract by means of a barium injection through the Levin tube was done after 48 hours of continuous gastric aspiration. During fluoroscopy, the presence of a filling defect was noted in the antral and prepyloric region of the stomach. Pressure on the filling defect with the aid of the spot device revealed the presence of lamellations within it. The position of the defect could not be altered by palpation. A cavity was noted to fill with barium immediately distal to the radiolucent defect. It was the impression of the fluoroscopist that this represented either an incompletely filled duodenal cap or filling of the gallbladder through a fistulous tract. Spot films were taken of the diseased area (fig. 2 *left*. The radiographs (fig. 2 *right)* verified the fluoroscopic impression of a radiolucent filling defect in the distal portion of the stomach. The barium-filled viscus to the right of the defect had the configuration and appearance of the gallbladder. A barium-filled tract between the stomach and the gallbladder was thought to represent a fistula. The duodenal bulb was at no time identified, and, therefore, the possibility that the radiolucent defect was impacted within the first portion of the duodenum could not be entirely excluded. The presence of air and barium was noted in the biliary tree on the films taken in the posteroanterior projection and on the spot films (fig. 2). The roentgen diagnosis was that of biliary fistula probably of the cholecystogastric type with a large impacted gallstone in the distal stomach. However, a cholecystoduodenal type could not be entirely excluded, since the duodenal bulb was not clearly identified. The diagnosis of a cholecystogastric fistula was preferred, since the fluoroscopist could not identify the pylorus proximal to the large filling defect.

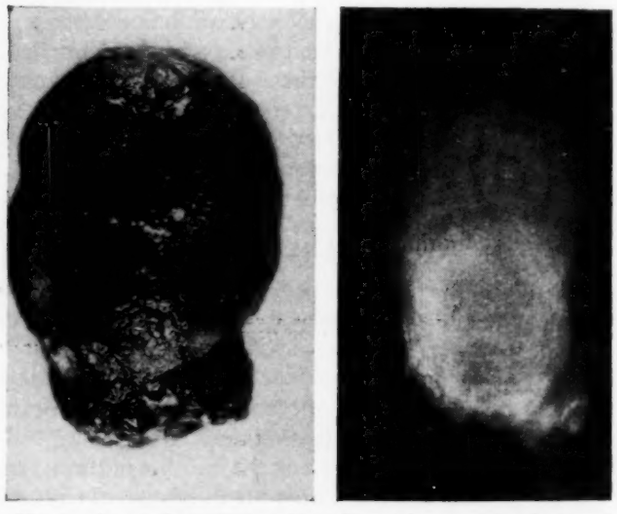

Fig. 3.—*Left*, gallstone measuring 4.5 by 3.0 cm. removed from the stomach. Narrowed portion of stone was removed from the pylorus, while the larger rounded portion was found in the antrum of the stomach. *Right*, radiograph of stone showing lamellations.

Surgical Findings.—At surgery a mass was palpated in the distal portion of the stomach to which the gallbladder was firmly adherent. An incision was made in the antrum, and a stone measuring 4.5 by 3 cm. was delivered (fig. 3). The distal end of the stone was projecting into the pylorus. The portion within the pylorus was narrower in diameter than the remaining portion in the antrum. It was our impression that the stone had become molded in shape to fit its anatomic location. The surgeon was able to identify a fistulous tract between the prepyloric region of the stomach and the gallbladder. The fistulous tract admitted the tip of the little finger. Therefore, this represented a cholecystogastric fistula with a stone obstructing the pylorus and having its largest portion within the antrum. After removal of the stone, the stomach and abdomen were closed.

SUMMARY

Spontaneous internal biliary fistulas secondary to long-standing biliary tract disease are an infrequent complication. The diagnosis is usually made at postmortem examination or at surgery as an unsuspected finding. Radiographic examination, however, can lead to a correct preoperative diagnosis.

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SUBCLINICAL POLIOMYELITIS IN A NEWBORN INFANT DUE TO INTRAUTERINE INFECTION

Alexis Shelokov, M.D.
and
Karl Habel, M.D., Bethesda, Md.

The problem of neonatal poliomyelitis has attracted considerable attention for a number of years. The writings on this subject abound with statements concerning complete insusceptibility of the fetus in utero to maternal disease, as well as a marked neonatal resistance of the infant to poliomyelitis whether or not the mother was afflicted. Recent reports of epidemic outbreaks involving infants well under 6 months of age [1] and increasingly frequent recording of recognized paralytic and fatal cases in infants born to mothers during the acute phase of poliomyelitis [2] challenge the validity of these time-honored concepts.

Several years ago, in a discussion of a neonatal paralytic case, it was suggested not only that it is likely that intrauterine infection takes place more often than is generally believed but that "some of the 'normal' infants reported . . . may actually have had mild unrecognized attacks of poliomyelitis." [3] The present study establishes by virus isolation and serologic testing the occurrence of such an inapparent subclinical infection in an infant born at the time his mother was in a respirator suffering from acute poliomyelitis. In addition, isolation of the virus not only from the infant at the time of delivery but also from the body of the placental villi points to the probability of intrauterine infection.

REPORT OF A CASE

The 36-year-old mother of this infant was admitted to the obstetric service of the Walter Reed Army Hospital on Sept. 26, 1954, in the third trimester of her pregnancy (gravida 4, para 2). She complained vaguely of some nocturia, dysuria, nausea, vomiting, and myalgia. The physical examination was completely negative, except for a pregnant uterus at 36 to 38 weeks' gestation and a temperature of 100 F (37.8 C). Because of a subsequent complaint of pain on neck flexion, a lumbar puncture was done on Sept. 28. The spinal fluid contained 200 leukocytes per cubic millimeter (86% lymphocytes and 14% polymorphonuclear cells) and 54 mg. of protein and 115 mg. of glucose per 100 ml. Other laboratory findings were not contributory to the diagnosis. On Sept. 30 she developed definite weakness of several muscle groups, including the diaphragm and intercostal muscles, and had to be placed in a tank respirator. Her status was essentially unchanged by Oct. 9, when, after four hours of spontaneous labor, she was delivered of a male infant. The delivery was accomplished with the patient under pudendal block anesthesia and positive-pressure oxygen breathing. Her respiratory status markedly improved soon after this, and, on Nov. 1, she was permanently removed from the respirator. The slow convalescence was characteristic of severe spinal paralytic poliomyelitis, with marked residual weakness involving both lower extremities, one hand, and the back. In May, 1955, she was transferred to a rehabilitation center.

The baby cried spontaneously and appeared well oxygenated at birth. His weight was 8 lb. 3 oz. (3,714 gm.). Careful physical examination revealed no abnormalities. He was given bottle feedings and remained well until discharge on Oct. 14. Since then he has been seen at regular intervals at the pediatric outpatient clinic of the Walter Reed Army Hospital. The only episodes of illness up to September, 1955, were two bouts of diarrhea in late October and mid-November, 1954. These were not associated with vomiting or any physical findings and were corrected by changes in the formula. Otherwise his growth and development have been normal.

METHODS

Throat and rectal swabs in Hanks' salt solution and specimens of amniotic fluid were treated with 500 units of penicillin and streptomycin prior to inoculation into tissue cultures. Solid specimens of stools, placental membranes, and placental substance proper were emulsified to make 10% suspension in Hanks' solution and treated with 1,250 units of penicillin and streptomycin both before and after centrifugation at 8,000 rpm for 30 minutes. (The placental membranes were repeatedly washed with sterile salt solution and carefully dissected from the body of the placenta, and a block of the placental villi was then excised.) All attempts at virus isolation and serum neutralizations were performed in roller tubes of trypsinized monkey kidney cells in monolayer sheets, prepared by a modified Youngner technique.[4] The cell cultures were grown in the lactalbumin hydrolysate-calf serum medium recommended by Melnick [5] and after four days of incubation were changed to a maintenance medium of 75% Earle's salt solution, 24% bovine serum ultrafiltrate, and 1% horse serum, with an additional 100 units of penicillin and streptomycin per milliliter.

In specimen testing, inoculums consisted of 0.2 to 0.3 ml., and in the case of stools the nutrient medium was replaced after one hour of incubation at 37 C. Neutralizing antibody titer determinations were carried out by serial fourfold dilutions of serums mixed with equal parts of one of three standard prototype TC virus pools diluted to contain 100 $TCID_{50}$ doses. After one hour at room temperature the mixtures were inoculated into two roller tubes each. End-points were determined by microscopic examination for cytopathogenic effect. Control mixtures of the same virus doses with normal serum and known immune serum were included in the test.

From the Laboratory of Infectious Diseases, National Microbiological Institute, National Institutes of Health.

The following members of the medical staff at the Walter Reed Army Hospital cooperated in this study: Col. Charles Christensen and Capt. Stephen Czarnicke, M.C., U. S. Army, and Major Robert Smith, M.C., U. S. Air Force.

1. Mouton, C. M.; Smillie, J. G., and Bower, A. G.: Report of Ten Cases of Poliomyelitis in Infants Under Six Months of Age, J. Pediat. **36**: 482, 1950. McConnell, A. A.: Poliomyelitis in Infants Under the Age of 6 Months, Arch. Dis. Childhood **27**: 121, 1952. Marberg, K.: Observations on Poliomyelitis During the 1950 Epidemic in Israel, Acta. med. orient. **11**: 61, 1952. Sims Roberts, J. T. C., and Thomson, D.: Poliomyelitis in Infancy, Especially in the Neonatal Period: Report of an Outbreak, Monthly Bull. Min. Health **12**: 152, 1953. Geffen, D. H., and Tracy, S.: Poliomyelitis in Children Under 6 Months in England and Wales During 1950, Brit. M. J. **2**: 427, 1953. Abramson, H., and Greenberg, M.: Acute Poliomyelitis in Infants Under One Year of Age: Epidemiological and Clinical Features, Pediatrics **16**: 478, 1955.

2. (*a*) Baskin, J. L.; Soule, E. H., and Mills, S. D.: Poliomyelitis of the Newborn: Pathologic Changes in Two Cases, Am. J. Dis. Child. **80**: 10 (July) 1950. (*b*) Kreibich, H., and Wolf, W.: Über einen Fall von diaplazentar erfolgter Poliomyelitisinfektion des Feten im 9. Schwangerschaftsmonat, Zentralb. Gynäk. **72**: 694, 1950. (*c*) Abramson, H.; Greenberg, M., and Magee, M. C.: Poliomyelitis in the Newborn Infant, J. Pediat. **43**: 167, 1953. (*d*) Read, A. E.: Poliomyelitis in Mother and Child in Trieste, Brit. M. J. **1**: 1307, 1954. (*e*) Bates, T.: Poliomyelitis in Pregnancy, Fetus, and Newborn, A. M. A. Am. J. Dis. Child. **90**: 189 (Aug.) 1955.

3. Shelokov, A., and Weinstein, L.: Poliomyelitis in the Early Neonatal Period: Report of a Case of Possible Intrauterine Infection, J. Pediat. **38**: 80, 1951.

4. Youngner, J. S.: Monolayer Tissue Cultures: I. Preparation and Standardization of Suspensions of Trypsin-Dispersed Monkey Kidney Cells, Proc. Soc. Exper. Biol. & Med. **85**: 202, 1954.

5. Melnick, J. L.: Tissue Culture Techniques and Their Application to Original Isolation, Growth, and Assay of Poliomyelitis and Orphan Viruses, Ann. New York Acad. Sc. **61**: 754, 1955.

COMMENT

A review of the literature discloses a number of reports of paralytic cases of neonatal poliomyelitis, certain features of which strongly suggest the possibility of intrauterine infection. In at least one such case, described by Kreibich and Wolf,[2b] it seems certain that the incubation period of the infection must have taken place in utero, as the infant died 12¾ hours after birth with histologically advanced lesions of poliomyelitis. Another case of probable intrauterine infection is that reported by Bates,[2e] who recognized preparalytic symptoms of poliomyelitis in a baby 40 hours old. However, until recently no virus isolation studies had been reported to confirm the existing clinical evidence. Schaeffer, Fox, and Li [6] were the first to report isolation of poliovirus (type 1) from the placenta and aborted fetus of a mother suffering from acute poliomyelitis. Swarts and Kercher [7] reported a fatal case of poliomyelitis in a newborn infant delivered by cesarean section a few minutes after maternal death due to poliomyelitis. The diagnosis in both mother and baby was confirmed histologically and by isolation of poliovirus (type 1) from spinal cord specimens.

TABLE 1.—*Isolations of Type 1 Poliovirus from Mother and Infant*

Mother		Date of Specimen, 1954	Baby	
Specimen	Virus Isolation		Specimen	Virus Isolation
Throat swab	—	10/2	.....	..
Serum and clot	—	10/2	.....	..
Enema	—	10/4	.....	..
Rectal swab	—	10/4	.....	..
Stool and swab	+	10/7	.....	..
Amniotic fluid	—	10/9 *	Cord blood clot	—
Placental membrane	+	10/9	Throat swab	—
Placental villi	+	10/9	Rectal swab A	+
			B	+
Blood clot and serum	—	10/11	Meconium	+

* Infant was born on Oct. 9.

Our studies show conclusively that, in the case described here, both the mother and her infant were infected with type 1 poliovirus. Table 1 lists the results of our attempts at virus isolation from various types of specimens. After several failures, the virus was finally demonstrated in a specimen of the mother's stool that was collected two days before delivery. The virus was also isolated from the rectal swab on the infant obtained at delivery, although his throat swab was negative. The presence of the virus in the rectal ampulla of the baby at that time, coupled with its isolation not only from the washed placental membranes but from the substance of the placental villi that was excised after stripping the membranes, strongly suggests that there had been an intrauterine exposure to the virus. The virus was again isolated from the infant's meconium collected two days after delivery. It is interesting to note that the amniotic fluid contained no detectable virus.

Serums were collected from both the mother and infant on the dates listed in table 2, which summarizes the results of titration of antibody levels against each of the three types of poliovirus. Seven days prior to delivery, or about 13 days following the onset of nonspecific symptoms, the mother's serum neutralized type 1 virus when used undiluted, but no antibodies against types 2 and 3 were detectable. Her serum two days after delivery neutralized type 1 virus at 1:16 dilution and apparently gave some cross neutralization of type 2 when used undiluted. Approximately two months after delivery the titer had risen to 1:256 against type 1 and was still at that level five months after delivery, while there was no demonstrable antibody against the other two types. The infant received but a low level of homotypic antibody from the mother as demonstrated in the cord serum at delivery, but at three months of age his level was 1:256. This level still existed at 5 months, with no serologic evidence of infection with the other two types. As the infant was never breast-fed, the question of postnatal transmission of antibodies does not arise, and the high antibody titers in both the mother and the infant represent independent immune responses to their own infections. There certainly appears to have been no evidence of immaturity of the immunogenic mechanism in the newborn infant.

According to our review of the literature, this is the first time that subclinical infection with poliomyelitis virus has been demonstrated in a newborn infant. Further investigations may show that infants born during the acute phase of maternal poliomyelitis are commonly infected, either by way of the placenta seeded during maternal viremia or by contamination with the mother's virus at the time of delivery.

SUMMARY

Type 1 poliovirus was isolated from a mother suffering from acute poliomyelitis and her infant born in a respirator. Serologic follow-up established conclusively that both patients had active infections with this virus type.

TABLE 2.—*Titration of Poliomyelitis Antibody Levels in Serums from Mother and Infant**

Mother Antibody Titer Against Poliovirus Type			Date of Specimen	Infant Antibody Titer Against Poliovirus Type		
1	2	3		1	2	3
0	<0	<0	10/ 2/54	..	...	...
..	...	...	10/ 9/54 †	4	<0	<0
16	0	<0	10/11/54	..	...	...
256	<0	<0	12/16/54	256	<0	<0
256+	<0	<0	3/24/55	256+	<0	<0

* Figures represent reciprocal of serum dilution neutralizing 100 $TCID_{50}$ of virus.

† Cord serum at delivery on Oct. 9, 1954.

Presence of the virus in the substance of the placental villi coupled with its isolation from the rectal ampulla of the infant at delivery suggests probable intrauterine infection. To our knowledge this is the first recorded case of subclinical poliomyelitis in an infant born during the acute phase of maternal disease.

6. Schaeffer, M.; Fox, M. J., and Li, C. P.: Intrauterine Poliomyelitis Infection: Report of a Case, J. A. M. A. **155**: 248 (May 15) 1954.

7. Swarts, C. L., and Kercher, E. F.: A Fatal Case of Poliomyelitis in a Newborn Infant, Delivered by Caesarean Section Following Maternal Death due to Poliomyelitis, Pediatrics **14**: 235, 1954.

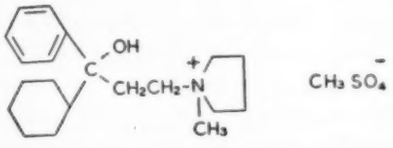
COUNCIL ON PHARMACY AND CHEMISTRY

NEW AND NONOFFICIAL REMEDIES

Monographs and supplemental statements on drugs that appear in this column have been authorized by the Council for publication and inclusion in New and Nonofficial Remedies. They are based upon the evaluation of available scientific data and reports of investigations.

H. D. KAUTZ, M.D., *Secretary.*

Tricyclamol Methylsulfate.—1-Cyclohexyl-1-phenyl-3-pyrrolidino-1-propanol dimethylsulfate.—The structural formula of tricyclamol methylsulfate may be represented as follows:



Actions and Uses.—Tricyclamol methylsulfate is an anticholinergic agent qualitatively similar in action to other drugs of that class. Available evidence indicates it is less effective in reducing secretory activity than hypermotility of the gastrointestinal tract and that the drug offers no advantage over other anticholinergic drugs such as methantheline and methscopolamine from the standpoint of over-all effectiveness, toxicity, or side-effects.

Tricyclamol methylsulfate may be employed clinically for the control of functional spasm of the gastrointestinal tract as an adjunct in the treatment of peptic ulcer, chronic gastritis associated with hyperacidity, pylorospasm, and irritable colon (mucous, spastic colitis). In these conditions it should be borne in mind that antispasmodic therapy may be less important than dietary restrictions and the use of sedative or antacid medication. Its value in the management of regional ileitis and ulcerative colitis, or for other purposes, has not been established.

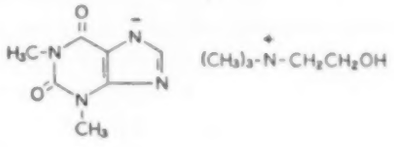
Tricyclamol methylsulfate may produce atropine-like side-effects characteristic of anticholinergic agents. Mouth dryness is most commonly encountered at therapeutically effective dosage levels. Occasional paralysis of ocular accommodation and infrequent difficulty in urination have been observed. As with other anticholinergic agents, the drug usually is contraindicated in glaucoma and should be employed with caution in patients with cardiac decompensation or coronary insufficiency, cardiospasm or achalasia, unrelieved duodenal obstruction, and prostatic hypertrophy or bladder neck obstruction. One case of psychosis resulting from toxic reaction to the drug requires further investigation. Until longer experience has been gained, physicians should be alert to the possible development of serious untoward effects that may result from continued use of the drug.

Dosage.—Tricyclamol methylsulfate is administered orally. Individual requirements for this drug vary widely, ranging between 50 and 500 mg., and averaging 100 to 150 mg. It is suggested that patients be started on a trial dosage of 50 mg. four times a day. This should be increased until a satisfactory response is obtained or the individual's tolerance is reached. The frequency of administration may be increased to six times a day, if indicated.

Preparations for use as stated for the foregoing drug are marketed under the following name: Elorine Methylsulfate.

Eli Lilly & Company cooperated by furnishing scientific data to aid in the evaluation of tricyclamol methylsulfate.

Oxtriphylline.—Choline theophyllinate.—The structural formula of oxtriphylline may be represented as follows:



Actions and Uses.—Oxtriphylline is a theophylline compound that produces the mild diuretic, myocardial stimulating, vasodilator, and bronchodilator actions of similar xanthine derivatives. (See the general statement on xanthine derivatives in New and Nonofficial Remedies.) Oxtriphylline is more soluble than aminophylline; it also appears to be more stable, is better absorbed from the gastrointestinal tract, and produces less gastric irritation. Thus it is tolerated orally in larger doses and produces higher theophylline blood levels than can be achieved with equal doses of aminophylline. Hence, in contrast to theophylline and theophylline compounds, which are poorly tolerated by the stomach, oxtriphylline can be administered orally in doses adequate for the management of bronchial asthma (including pulmonary emphysema) and for the control of paroxysmal cardiac dyspnea and Cheyne-Stokes respiration. Like other theophylline compounds, it is also effective as a mild diuretic for the management of dependent and chronic pulmonary edema secondary to congestive heart failure. The drug also may be tried in selected cases of angina pectoris and coronary disease whenever myocardial stimulation would not be harmful. Its usefulness in premenstrual tension or in dysmenorrhea has not been established.

Oxtriphylline is essentially nontoxic at clinically effective dosage levels. Comparative studies with other theophylline compounds that are well tolerated orally have not been made.

Dosage.—Oxtriphylline is administered orally. In the treatment of asthma, dosage for adults may range from 0.1 to 0.4 gm., four times daily. The recommended initial dosage is 0.2 gm. Two weeks or more may elapse before the full effect develops. The usual dosage for children 6 years of age or older is 0.1 gm. three or four times daily; the drug is not recommended for younger children.

Preparations for use as stated for the foregoing drug are marketed under the following name: Choledyl.

Nepera Chemical Company, Inc., cooperated by furnishing scientific data to aid in the evaluation of oxtriphylline.

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HISTAMINIC CEPHALALGIA

GUEST EDITORIAL

Bayard T. Horton, M.D.

Histaminic cephalalgia is a distinct clinical entity that usually begins in the later decades of life.[1] It is characterized by a unilateral headache of short duration generally lasting less than an hour; it commences and often terminates suddenly. It tends to awaken the patient at night one to two hours after he has gone to sleep, and the severity of the pain makes the patient get out of bed and pace the floor. At its height the pain is associated with watering and congestion of the eye, rhinorrhea or stuffiness of the nostril, sweating, and, often, visible dilatation of the temporal vessels of the involved side of the head. Once observed in its full-blown form, the clinical picture will never be forgotten.

Constant, excruciating, burning, and boring pain is the outstanding complaint. It involves the orbital area and the temple and may extend to the upper jaw, occipital region, neck, and shoulder. Severe and frequent attacks of pain may occur as often as 20 times or more a week. There are no trigger zones, and the pain is not confined to the distribution of any cranial nerve but has a tendency to conform to the ramifications of the external carotid artery. The transmission pain pathways of histaminic cephalalgia have not been worked out completely.[2] The attacks are usually not accompanied by gastrointestinal symptoms or visual disturbances. About 90% of the patients are men over 40 years of age. Attacks tend to occur in a series, and remissions and exacerbations occur spontaneously. Horner's syndrome is not uncommon in this type of case. The latter may disappear, after a given series of attacks have ceased, or may remain permanently. Skin testing is not a prerequisite for either diagnosis or treatment.

An error in diagnosis is usually due to the fact that the physician has not had an opportunity to observe the patient in the course of a spontaneous or induced attack of pain in the head. The reproduction of the attack and its subsequent abortion are of great value, although not always possible. Approximately 40% of patients have observed that alcohol will precipitate attacks and have refrained from its use. In cases of histaminic cephalalgia, the subcutaneous administration of 0.35 mg. of histamine base often will precipitate an attack identical with the one the patient has attempted to describe. This dose will trip the mechanism in more than 60% of patients if the test is carried out during a given series of attacks, whereas the test is apt to prove negative if carried out during the "free interval" between series of attacks. The sublingual administration of 1/50 grain (0.0013 gm.) of glyceryl trinitrite also will frequently precipitate an attack of histaminic cephalalgia in a patient with this illness, but it is not so satisfactory a provocative agent as histamine. The induced attack usually can be aborted promptly by the intravenous administration of 1 cc. of dihydroergotamine (DHE45).

"Histamine headache" and "histaminic cephalalgia" should not be regarded as synonymous terms. Histamine headache, which is an immediate physiological response, only lasts for 5 to 10 minutes. It occurs in normal persons as well as in those who have histaminic cephalalgia. However, in cases of histaminic cephalalgia, reproduction of the typical attack occurs after the physiological effects of the drug have ceased. The induced attack usually occurs within one hour after the administration of the drug and occurs only in cases of histaminic cephalalgia. It represents a pathological response to the drug. The pain of histamine headache is chiefly intracranial in origin, whereas the pain of histaminic cephalalgia is chiefly extracranial in origin.

Histaminic cephalalgia appears to represent a localized anaphylactoid reaction, with both localized and systemic manifestations. During spontaneous and induced attacks it seems evident that histamine is released from the shocked tissues in the region of the pain and accounts for most local phenomena. The increased acidity of the gastric contents indicates absorption of this agent in the blood stream and is comparable to that which is induced by the subcutaneous injection of known amounts of histamine. A relationship between acute duodenal ulcer and histaminic cephalalgia has been observed.[3] Other biological agents may be liberated in the region of pain.

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1. (*a*) Horton, B. T.; MacLean, A. R., and Craig, W. McK.: A New Syndrome of Vascular Headache: Results of Treatment with Histamine: Preliminary Report, Proc. Staff Meet., Mayo Clin. **14**: 257-260 (April 26) 1939. (*b*) Horton, B. T.: The Use of Histamine in the Treatment of Specific Types of Headaches, J. A. M. A. **116**: 377-383 (Feb. 1) 1941. (*c*) Marsiaj, N.: Sindrome de Horton, in Clínica médica: Lecciones de patología y de clínica, Buenos Aires, El Ateneo, 1948, pp. 429-471. Horton, B. T.: (*d*) Symposium: Head and Face Pain: Medicine, Tr. Am. Acad. Ophth. **49**: 23-33 (Sept.-Oct.) 1944; (*e*) Headache: Clinical Varieties and Therapeutic Suggestions, M. Clin. North America **33**: 973-1005 (July) 1949. (*f*) Ekbom, K. A.: Ergotamine Tartrate Orally in Horton's "Histaminic Cephalgia" (Also Called Harris's "Ciliary Neuralgia"): A New Method of Treatment, Acta psychiat. et neurol., suppl. 46, pp. 105-113, 1947. (*g*) Horton, B. T.: Histaminic Cephalgia, Journal-Lancet **72**: 92-98 (Feb.) 1952. (*h*) Schiavo, A. J.: Cefalgia histaminica (sindrome de Horton), Prensa méd. argent. **42**: 1262-1277 (May) 1955. (*i*) Horton, B. T.: Histaminic Cephalgia: Different Diagnosis and Treatment, Bull. Tufts New England M. Center **1**: 143-156 (July-Sept.) 1955.

2. White, J. C., and Sweet, W. H.: Pain: Its Mechanisms and Neurosurgical Control, Springfield, Ill., Charles C Thomas, Publisher, 1955, pp. 494-544.

3. Horton, B. T.: Histaminic Cephalgia Resulting in Production of Acute Duodenal Ulcer, J. A. M. A. **122**: 59 (May 1) 1943; The Clinical Use of Histamine, Postgrad. Med **9**: 1-10; 88-100 (Jan.) 1951.

Histaminic cephalalgia is a medical, not a surgical problem, and yet about 40% of patients who have been under my care have previously undergone various minor and major surgical operations in a vain attempt to obtain relief from their pain.

The object of treatment should be twofold: (1) to alleviate the pain of the acute attack and (2) to prevent subsequent attacks. The intravenous administration of 1 cc. of dihydroergotamine frequently will abort an acute attack in one to five minutes if it is administered at the onset. In a few cases, the breathing of 100% oxygen will alleviate the pain if the attack is mild and if the patient resorts to the use of oxygen promptly. These two procedures may be combined. A rectal suppository that contains 2 mg. of ergotamine tartrate and 100 mg. of caffeine, if used at bedtime, either with or without a sedative, frequently will prevent nocturnal attacks. Histamine "desensitization" is the treatment of choice for preventing future attacks. The procedure appears to be very simple, but it is often fraught with pitfalls.

Ampuls of 0.275 mg. of histamine diphosphate per cubic centimeter, equivalent to 0.1 mg. of histamine base, are used. The initial dose is 0.05 cc. and is given subcutaneously. Two injections are administered daily about 8 to 12 hours apart. Each injection is increased by 0.05 cc. until 0.50 cc. is given. In some instances, this amount is not adequate and it is necessary to continue to increase the amount until 0.75 cc. or even 1 cc. is reached. Adequate dosage is determined by the patient's response.

More than 90% of the patients have obtained complete relief from their attacks of histaminic cephalalgia by means of histamine therapy. Some patients find it necessary to continue to use one or even two injections daily at home in order to remain free of symptoms.

It is usually easy to treat a patient with histaminic cephalalgia when he is observed for the first time, provided he has not previously had histamine therapy. However, if the patient has had histamine therapy previously, and especially if the dose has been above his reaction level and an attempt is made to repeat the procedure, the problem becomes increasingly difficult. A consistently decreasing dose is employed to treat the patient who has succeeding series of attacks of histaminic cephalalgia. If the same dose is used for the third, fourth, or fifth series of attacks as was employed in the first series, the patient may be made worse instead of better.

Many patients report a recurrence of attacks of histaminic cephalalgia coincident with, or after recovery from, an infection of the upper respiratory tract. The patient's "sensitivity" to histamine appears to be enhanced after such infectious processes. That a patient's enhanced sensitivity to histamine can be altered by cortisone (compound E) was first demonstrated in 1941 after intramuscular injections of 20 and 40 mg. of the hormone.[1g] Originally I had employed Kendall's whole cortical extract for this purpose. Cortisone and corticotropin (ACTH) seem to alter the patient's reaction to histamine, or at least to "recondition" him so that he will again respond to the drug in a satisfactory manner.

In some patients it has been necessary to give histamine intravenously in a 1:10,000,000 dilution by drip method, and, frequently, this weak dilution, when given at the rate of 30 drops per minute, will provoke an attack of histaminic cephalalgia within an hour. This reaction provides a measuring stick, so to speak, that indicates, in a crude way, the patient's sensitivity to the drug. If, for example, an attack is provoked at the end of 60 minutes, treatment thereafter is carried out for a period of 40 to 45 minutes; many patients respond in a satisfactory manner to this form of therapy. The schedule has to be "tailor made" to fit the individual. The use of cortisone in the treatment of histaminic cephalalgia has been disappointing to date. Cortisone and corticotropin are helpful in the readjustment of the histamine schedule.

Histamine is a most potent therapeutic agent, and the physician must learn how to use it. It is a useful drug—if employed wisely.

SUMMARY OF SURVEY OF PHYSICIANS' ATTITUDES TOWARD VOLUNTARY HEALTH INSURANCE

The Council on Medical Service, through its Committee on Prepayment Medical and Hospital Service, has conducted a Survey of Physicians' Attitudes toward Voluntary Health Insurance. Attitudes and opinions are important factors in the lives of most people. They influence not only the day-to-day routines but many long-range plans as well. With health insurance of some type being carried by or for over 100 million Americans, the sum total of the opinions and attitudes has a significant influence upon the lives of a substantial proportion of our population. A summary of the survey is being published in pamphlet form and is scheduled for early distribution. In preparing for the survey, the Committee conferred with representatives of Blue Shield and other interested groups.

The survey included 15,000 physicians selected at random from American Medical Association records. Prior to the random sampling, the cards for graduates subsequent to 1948 were removed to assure, insofar as possible, reaching physicians who had completed residency training and who were not likely to be serving obligatory military duty. Moreover, it was the desire to reach a representative number of physicians who might be presumed to have had some experience in the realm of health insurance. This was the wish of the sponsors of the survey, because health insurance is highly subjective and realistically cannot be considered solely in the realm of theory. Accordingly, questionnaires were mailed to physicians who were (1) in active private practice, (2)

on a medical school teaching staff, or (3) employed by an industry, private philanthropic organization, hospital (other than federal), or local or state government.

Few would question that health insurance has had and undoubtedly will continue to have substantial influences on medical practice. Just what all of the influences are and their extent are elements that are difficult to determine. These problems are complicated by the fact that different groups have varying opinions of what health insurance is or should be as well as divergent views as to its true purpose. As the forward to the summary states: "While there are undoubtedly several groups and subgroups having a valid interest in health insurance, the three principal general groupings may be identified as: (1) the insuring public (buyers of insurance who are also the recipients of health care); (2) the insuring organizations; and (3) the providers of health care, the majority of whom are physicians."

From time to time alleged representatives of nonmedical special interest groups have indicated what voluntary health insurance could or should do for their constituents. Frequently, the stated objectives indicate rather clearly a lack of understanding of the various elements of health insurance as well as a further lack of knowledge of the many components of health care. The position of the medical profession, at large, may be rather unique in that the profession has not only an enlightened self-interest but a public interest as well.

It is perhaps significant that over 8,000 physicians took the time and trouble to express their opinions on several aspects of this subject that is becoming increasingly important not only to the profession but to more and more members of the general public as well. The majority of respondents were of the opinion that voluntary health insurance, of some type, is generally available. Most available were reported as Blue Shield and Blue Cross (considered together), private insurance, and consumer-sponsored plans, in the order mentioned. Over one-half of the physicians answering expressed the opinion that all agencies should provide health insurance benefits on a competitive basis. This section of a multiple-answer question received more mentions than did any of the separate categories listed. It is also interesting to note that the majority of respondents thought the true purpose of health insurance was to provide financial assistance. This is in keeping with the primary function of health insurance as stated by the American Medical Association. In other words, such programs should be considered more properly as financial mechanisms rather than as agencies for guaranteeing either the availability or the provision of health care.

While there are those who might feel that responses to questionnaires are presumptions of attitudes and opinions in general, a much safer assumption is that they reflect the attitudes of the respondents only. As the conclusion of the summary indicates, "It is emphasized that this summary report should be considered only as research or 'background' material." Single copies of the summary may be obtained, upon request, from the office of the Council on Medical Service.

NATIONAL PULSE BEAT

Public opinion surveys, such as the one on Americans' feelings about doctors reported elsewhere in this issue (page 471), are a useful way of taking the nation's statistical pulse—but unfortunately they do not always explain why the pulse beats as it does. If the rhythm at times seems erratic, it may take some diagnostic skill to trace the cause.

This survey shows a noticeable quirk that conscientious doctors will want to examine. It should be no surprise to them to find that people in general like and respect their personal physicians. What may be surprising—and unexplained in statistical tables—is that there is a striking difference between Americans' good opinions of their own doctors and their impressions of doctors in general, who they do not know personally.

There are possibly many reasons for this peculiarity. It can be reasonably assumed that patients, especially because they are involved in such an emotional situation as illness, do exaggerate their complaints about their doctors when speaking to friends or relatives. It is not hard to imagine a 15-minute pause in the waiting room transformed into an hour's impatient vigil when reported to a sympathetic listener. This listener may like his own doctor and appreciate his promptness, but, when asked his impression about other doctors, he may remember the friend's complaint and reply that "doctors in general keep their patients waiting too long." Since doctors are hardly capable of changing the quite human trait of sympathy seeking, there is apparently no preventive for this, except to continue trying to please as many patients as much as possible.

However, the opinion research agency suggests another reason for the differing impressions reported by the public, a reason that, if valid, offers doctors an opportunity to smooth the irregularities in the pulse beat. The agency said it seems evident that the individual doctor needs to form a better opinion of his colleagues and to convey that opinion to his patients. If he himself helps create derogatory impressions of other doctors, he thwarts the public relations efforts of his profession.

Again, there is no statistical proof that this theory is the only correct one, but a revealing disclosure in the survey may give some insight. It was found that the only area in which the doctor's self-esteem outdid the public's was on the question of fees. Doctors who were questioned seemed to expect the public to be critical of fees; the public itself was much more concerned about personal qualities and service. This is an indication that the doctor is defending himself against an attack that is not being made, while letting his guard down where the blows are being aimed.

Neither the agency's report nor the summary of it in this issue states any further conclusions about the results. The facts are simple and clearly stated, and it is up to the physician to examine them and make his own conclusions, keeping in mind this suggestion: when the public speaks of "other doctors," it means all doctors, and no individual, however exemplary his behavior, is excluded from criticism. It would seem wise for every doctor to examine the report and then to place a questioning finger on his own wrist.

ORGANIZATION SECTION

PUBLIC OPINION SURVEY ABOUT DOCTORS

This study was sponsored by the American Medical Association in order to find out what might be needed to improve doctors' services. From it emerged a picture of what people like about and expect from their doctors: sympathy, patience, and understanding, rather than guaranteed cures and "wonder drugs." What they criticize is a matter of time and economics, not of personality or ability.

MAJOR FINDINGS

Major items shown by the survey are as follows: 1. Most Americans have their own family doctor. 2. Most of them like him and like doctors as a group. 3. People's opinions gained from their own experience differ from those based on hearsay or other sources. 4. Doctors are more critical of themselves than are other people. 5. When people criticize physicians, it is largely for the cost of care; they do not, however, think doctors are trying to "get rich quick." 6. They are evenly split for and against "sliding scales" of fees.

Ninety-six per cent of the people who have a family doctor say they like him personally; between 88 and 98% have a high opinion of his intelligence, capability, dedication to humanity, and personal interest in patients. Their most unfavorable comments are that he thinks he is always right and that he is hard to reach for emergency calls. Americans have a good opinion of doctors generally; 93% of all those surveyed say doctors as a group are "likable." But people are more inclined to think in impersonal terms and to use different standards in judging doctors other than their own. The proportion of favorable attitudes is lower, and denial of faults less emphatic, when they speak of doctors they do not know personally. About doctors in general they are critical mostly of fees, coldness, impatience, lack of frankness, unavailability, and incompetence.

In personal interviews with 4,000 people during 1955, surveyors got the answers to questions based on preliminary discussions with the public and with physicians and on information from current literature. The survey was conducted by Ben Gaffin & Associates, Chicago, with interviews by 289 surveyors from the United Interviewing Company, an associated group. Although the A. M. A. approved the questionnaires, after completion the survey firm said in its report "it is to be emphasized that the public, individual doctors, and the research agency established the issues."

METHOD

Interviewees were selected so that the proportion of people from various age, economic, geographical, and other groups matched the proportion of such people in the total population of the United States. Among them were 3,000 private citizens; 500 practicing physicians; 100 editors, commentators, and columnists; 100 attorneys; 100 registered nurses; 100 registered pharmacists; and 100 nonphysician executive secretaries of state and county medical societies. Questions about general public attitudes were asked only of the 3,000 individuals; the special groups were asked largely about professional or organizational matters. Doctors were asked their feelings about themselves and other doctors.

RESULTS

Five-sixths (82%) of Americans have family doctors. Ninety per cent of rural farm dwellers have their own physicians and high percentages also are found among white-collar workers; middle-aged, middle-income, college-trained people; and central state residents. While two-thirds of these people once had other personal physicians than their present one, their reasons for changing doctors rarely include personality clashes or lack of faith in the doctor's ability. The most frequently given reason (by 19%) is that the patient or the doctor moved. Only 5% say they lost confidence and 2%, that they "found a better doctor."

Most people tend to think of their doctor as "someone special" and feel that today, even more than 20 years ago, it is important to choose the right man. Fifty-eight per cent believe it matters "a lot," giving as reasons "ability, training, and equipment" first and confidence or sincerity next. The 24% who say it doesn't matter explain most often that doctors have the same education and qualifications.

About 8 of 10 people think their doctor is "different." For their reasons, 32% cite personal interest, sympathy, and kindness; 19%, competence, intelligence, and education; 17%, friendliness, personality, and manner; and 9%, frankness and honesty. Small numbers mention availability, patience, understanding, acceptance of payment delays, and lower fees. None mention healing powers or use of wonder drugs, although those who say choice of physicians is not important do mention drug use as a factor. Of those persons who have a personal physician, only 1% do not like him and 3% give qualified or no replies. Ninety-nine per cent say he is capable and 88%, "highly intelligent." Between 80 and 90% feel their doctor has enough personal interest, is frank enough, and gives his patients as much time as they would like.

Most people, when speaking of their own doctors, deny complaints listed in a true-false questionnaire. For example: Ninety-one per cent deny (5% agree) that their doctor thinks he is better than other people; 87% say (6% deny) that he is as dedicated to serving mankind as he should be; 82% deny (5% agree) he is too quick to recommend operations; 80% say (15% deny) he is frank enough about their illnesses; 78% deny (15% agree) he keeps patients waiting longer than necessary. Seventy-nine per cent deny (16% agree) he charges too much; 77% deny (10% agree) he plans to get rich quickly; 78% deny (13% agree) his charges have gone up faster than other living costs; 74% deny (19% agree) he is hard to reach for emergency calls; 71% deny (23% agree) that he has the idea he is always right; and 66% deny (13% agree) that he makes too much money compared with his patients.

On only three statements of complaint was there less than 66% denial, but these three statements were not answered by about half the interviewees. They were as follows: Your doctor charges higher fees to people who carry medical insurance: 48% deny, 39% no opinion; your doctor splits fees on referrals to other doctors: 32% deny, 57% no opinion; your doctor gets commissions from druggists: 31% deny, 52% no opinion.

Most people give the same reasons for liking doctors in general as they do for their own physicians, with some exceptions. They attach more importance to friendliness and manner, healing and curing, dedication, and professional attitude than when describing personal physicians. Given a chance to criticize, one third have no criticism and 15% "don't know" what they don't like about most doctors. Leading complaint, listed by 13%, is "their charges and interest in money." Nine per cent mentioned each of these complaints: "don't take time and hurry you too much," "impersonal, cold, independent," and "not frank, speak half-truths, dishonest." Some of those listing dislikes say their complaints refer only to "some, not most" doctors.

"TRUE-FALSE" RESULTS

The 2,462 interviewees who said they have a personal physician were given true-false statements referring to their own doctors. Then all 3,000 interviewees were given the same set of questions to answer regarding "other" doctors. While 23% was the largest proportion answering "true" to any complaint listed about their own doctor, 60% was the largest in evaluating complaints about doctors in general. This difference in attitude can be seen by some of their answers:

Doctors don't give patients as much time as patients would like: about other doctors, 60% say true; about my doctor, 18% true.

Most doctors try to hide other doctors' mistakes: 54% true (not asked about personal physicians).

Doctors are hard to reach for emergency calls: other doctors, 51% true; my doctor, 19%.

Doctors are not frank enough: other doctors, 46% true; my doctor, 15%.

They charge too much: other doctors, 43% true; my doctor, 16%.

They think they are always right: other doctors, 43% true; my doctor, 23%.

They keep people waiting too long: other doctors, 41% true; my doctor, 15%.

They don't have enough personal interest in patients: other doctors, 39% true; my doctor, 11%.

Their charges have gone up faster than other living costs: other doctors, 35% true; my doctor, 13%. These figures were about the same for the statement that doctors make too much money compared to their patients.

The various other charges are considered true by less than one-third of the public.

The public does have a realistic idea of the number of years of training required to practice medicine. The most common answer, given by 28%, is 8 years; the next most common, 10. Seven years is the shortest period mentioned, and 19% say 11 years or more. According to the largest number (26%), doctors never retire. Twenty-one per cent give 65-69 years as average retirement age, while other answers vary from 60 to "75 years or older." Only 6% say doctors retire before 60. However, rural farm dwellers, people over 55, and professional people, in much larger proportions than the general public, say doctors work their entire lives. The public's median estimate of their own doctor's work week is 64 hours, with 12.5% of this time given to charity work; 63 hours and 12% is the public estimate for doctors in general. This is usually close to the doctors' own estimates: 62.5 hours and 13% charity.

Doctors are more critical of themselves than are their patients; their agreement that some of the listed complaints are true ranges as much as 20% above the public's. They agree closely with the public on estimates of their capability, intelligence, and willingness to accept medical advances and feel most appreciated for competence, sincerity, and healing abilities. They are quicker than their patients to agree that they do not give as much time as they would like, and on lack of availability for emergencies. About half of the public but only a fifth of the doctors think there are not enough doctors in the United States; however, only 9% of the public blame the medical profession (or A. M. A.), and 45% say the profession encourages young people to become doctors.

FINDINGS ON A. M. A.

People apparently do not form their opinions of doctors in general from knowledge of the A. M. A., since only half of them say they have any knowledge of it. Those who do chiefly remember general publicity, drug researches, professional standards, conventions, and opposition to government medicine. About a fifth of those who know the A. M. A. remember anything specific about it. Predominantly favorable attitudes are held by people familiar with the A. M. A.; 43% say their opinion is "all good," 26% "more good than bad," 13% "about equal," 4% "more bad than good," and 1% "all bad."

One-fourth of those who know the A. M. A., and about half of the doctors, believe it is run by minority rule, but few object to this; 69% of those who know the A. M. A. and 77% of the doctors say the organization's policies are what doctors in general want. Most of these people say the A. M. A. exercises the right amount of control over physicians and is not "prejudiced" against any particular type of person or doctor (except a few who mention osteopaths and chiropractors). Most people also approve of the strictness of A. M. A. standards for medical schools and hospitals.

Neither the public nor doctors are very critical of the A. M. A.'s political activities. One-fourth of the public and half the doctors say this activity is "about the right amount"; 15% of the public and 16% of doctors that it is "too much"; 4% of the public and 19% of the doctors that it is not enough. With few exceptions, the findings about the total public apply also to subgroups: men and women, young and old, white-collar and blue-collar, and geographically different groups. Some minor differences, tending to be less favorable, are seen in people over 65, nonwhites, southerners, low-income groups, non-high-school educated persons, and those without personal physicians. Interestingly, the percentage of differences in opinion between union and nonunion persons is almost indistinguishable.

BUREAU OF MEDICAL ECONOMIC RESEARCH

A STUDY OF MEDICAL SCHOOL ALUMNI

Frank G. Dickinson, Ph.D., Chicago

This summary of a comprehensive study of the alumni of medical schools contains only a few of its more than 620 tables. For clarity, it is necessary to refer to some of the omitted tables, which are available in publications of the Bureau of Medical Economic Research.—ED.

The Bureau of Medical Economic Research maintains a punch-card file on all physicians in the United States, including those who are not in active private practice and those who are not members of the American Medical Association. The information is obtained from the Directory Department of the A. M. A. Among the punched items of information regarding the physician are his year and school of graduation. The punch-card deck, as of April, 1950, was extensively used in the preparation of our studies of the distribution of physicians by medical service areas.[1] (The tables in the appendix of Bulletin 94 showing the distribution of the 205,000 physicians by age, by state, by type of practice, and by city size will help as background reading for the present study of alumni. Bulletin 94 should not be confused with the Bureau's Miscellaneous Publication M-94.) Before putting this deck in storage, it was decided to sort the cards by medical school and year of graduation and to prepare a number of cross classifications. Since the data are old, no special checks were made on their accuracy as to year and school of graduation. More than 620 tables were developed; 600 of these were published in Bureau publication (multilithed) M-94, Supplement to Bulletin 101. The remaining tables, including those presented herein, have been published in Bureau Bulletin 101, Distribution of Medical School Alumni in the United States as of April, 1950. (Single copies of Bulletin 101 [44 pages] will be sent upon request. Distribution of publication M-94 [511 pages] will be largely restricted to medical schools; approximately 560 of the tables are individual tables for the 71 United States four-year medical schools then approved.

It is difficult to summarize so many facts. The task is made more difficult by a desire to avoid any inference that these data on alumni provide a system for rating the schools; hence this summary of the findings will feature percentages and rankings; there are no rankings in publication M-94.

Director, Bureau of Medical Economic Research, American Medical Association.

The tables in this study were prepared under the supervision of Lee Ann Layton and Jane Ann Boxman, Research Assistants in the Bureau of Medical Economic Research.

1. Dickinson, Frank G., Distribution of Physicians by Medical Service Areas, Bulletin 94, Bureau of Medical Economic Research, Chicago, American Medical Association, 1954.

1a. This table was also published as table 23 in the Education Number of THE JOURNAL, Oct. 8, 1955. Limitations on the data in this and other tables and definitions of type of practice categories are presented in the appendix to the Bureau Bulletin 101.

FOUR GROUPS OF SCHOOLS

Of the 205,000 physicians living in the United States in April, 1950, 164,409 (or 80.2%) were alumni of the 71 four-year medical schools then approved in the United States. (See table 9; basic tables 1 to 8 are presented only in Bureau publication M-94.) In April, 1950, there were 72 approved four-year medical schools in the United States, but one of them, the University of Washington, had no alumni. Of the 205,000 living alumni, 27,066 (or 13.2%) were the alumni of 182 other U. S. medical schools; these schools had gone out of existence prior to 1950. A total of 4,120 (or 2.0%) were graduates of 13 Canadian medical schools, and 9,395 (or 4.6%) were graduates of 225 foreign medical schools. (If the Bureau makes another study of the distribution of medical school alumni as of 1957, it is possible that the percentage of foreign school graduates will exceed 4.6.) Since our primary interest is in the alumni of the approved U. S. schools, the only data presented herein on the alumni of the other three groupings of schools are in table 9.[1a]

The alumni of the 71 approved U. S. four-year medical schools comprised 73.5% of the general practitioners and 84.2% of the full-time specialists as compared with 80.2% of all physicians. Stated in another way (part C of table 9), only 34.1% of these alumni were general practitioners as compared with 37.2% of the 205,000 physicians; on the other hand, 29.2% of these alumni were full-time specialists as compared with 27.8% of the 205,000 physicians. Relatively high percentages of the graduates of other U. S. medical schools and of foreign medical schools—52.8% and 47.9%—were general practitioners; and an extremely high percentage, 13.3%, of the graduates of other U. S. medical schools were retired or not in practice, indicating that many of these physicians graduated many years ago.

TABLES OF PUBLICATION M-94

In general, each of the eight series of tables in publication M-94 includes one table for each of the 71 schools and four summary tables—"a," "b," "c," and "d." Each "a" table provides a summary of the data for the 71 approved four-year schools and, in tables 1-6, classifies the alumni as of April, 1950, into five-year graduation groups, with all graduates prior to 1900 in one group. The "b," "c," and "d" tables present similar data for the alumni of other U. S. medical schools, the Canadian schools, and the foreign schools.

Since our emphasis is upon the distribution of the alumni of the approved four-year U. S. schools and what the alumni were doing in 1950, one summary table from publication M-94 is reprinted below. Table 1a is a breakdown by five-year graduation classes of the data in column (2) of table 9 for the 71 approved U. S. four-year medical schools. The number of alumni by type of practice of each five-year graduation class group is presented in table 1a, as numbers in part A and as percentages in parts B and C. The percentages in part B total 100.0 for each type of practice, and those in part C total 100.0 for each five-year graduation class group. In other words, part B presents row percentages and part C, column percentages. Of the 164,409 alumni of the 71 approved four-year medical schools residing in the U. S.

in April, 1950, 27,198 were graduates of the classes 1945-1949, approximately 30,000 were graduates of the classes of 1940-1944, 23,900 of the classes 1935-1939, 22,000 of the classes of 1930-1934, 17,200 of the classes of 1925-1929, and 11,400 of the classes of 1920-1924. The remaining 32,757 alumni were graduated prior to 1920. Percentages are shown in part B of table 1a; 16.5% of the alumni of the 71 approved four-year medical schools were graduated in the five-year period

TABLE 9.—*Type of Practice Distribution by School Groupings (Summary of Tables 1a-1d of M-94)*

Type of Practice *	Approved U. S. 4 Yr. Medical Schools	Other U. S. Medical Schools	Canadian Medical Schools	Foreign Medical Schools	Total
(1)	(2)	(3)	(4)	(5)	(6)
A. Number					
1. General practitioners	56,000	14,278	1,381	4,499	76,158
2. Part-time specialists	18,341	3,261	451	1,207	23,260
3. Full-time specialists	48,022	5,057	1,398	2,557	57,034
1-2-3. Active private practice	(122,363)	(22,596)	(3,230)	(8,263)	(156,452)
4. Administration, research, industry, local government	813	108	41	52	1,014
5. Full-time medical school staff	1,558	84	51	76	1,769
6. Federal government	9,156	542	130	415	10,243
7. Retired and not in practice	6,366	3,604	215	237	10,422
8. Interns	8,612	12	117	42	8,783
9. Residents	15,541	120	336	310	16,307
Total physicians	164,409	27,066	4,120	9,395	204,990
B. Percentage Distribution by School Groupings					
1. General practitioners	73.5%	18.8%	1.8%	5.9%	100.0%
2. Part-time specialists	78.9	14.0	1.9	5.2	100.0
3. Full-time specialists	84.2	8.9	2.4	4.5	100.0
1-2-3. Active private practice	(78.2)	(14.4)	(2.1)	(5.3)	(100.0)
4. Administration, research, industry, local government	80.2	10.7	4.0	5.1	100.0
5. Full-time medical school staff	88.1	4.7	2.9	4.3	100.0
6. Federal government	89.4	5.3	1.3	4.0	100.0
7. Retired and not in practice	61.1	34.6	2.0	2.3	100.0
8. Interns	98.1	0.1	1.3	0.5	100.0
9. Residents	95.3	0.7	2.1	1.9	100.0
Total physicians	80.2	13.2	2.0	4.6	100.0
C. Percentage Distribution by Type of Practice					
1. General practitioners	34.1%	52.8%	33.5%	47.9%	37.2%
2. Part-time specialists	11.1	12.0	11.0	12.9	11.3
3. Full-time specialists	29.2	18.7	33.9	27.2	27.8
1-2-3. Active private practice	(74.4)	(83.5)	(78.4)	(88.0)	(76.3)
4. Administration, research, industry, local government	0.5	0.4	1.0	0.6	0.5
5. Full-time medical school staff	0.9	0.3	1.2	0.8	0.9
6. Federal government	5.6	2.0	3.2	4.4	5.0
7. Retired and not in practice	3.9	13.3	5.2	2.5	5.1
8. Interns	5.2	0.1	2.8	0.4	4.3
9. Residents	9.5	0.4	8.2	3.3	7.9
Total physicians	100.0	100.0	100.0	100.0	100.0

* Definitions used in these nine classifications and limitations on the source data, particularly on interns and residents, are found in Bureau of Medical Economic Research Bulletin 101 (Appendix). In most of the other tables in this study the following abbreviations for the nine type of practice categories are used: general practitioner—G. P.; part-time specialist—P. T. S.; full-time specialist—F. T. S.; active private practice (sum of G. P., P. T. S., and F. T. S.)—A. P. P.; medical administration (medical societies, insurance companies, etc.), research, hospital administration, industrial physicians, state and local government—Admin., etc.; full-time medical school staff (with little or no private practice)—FT Med. Sch.; federal government—Fed. Govt.; and retired and not in practice—Ret. & NIP.

1945-1949, 18.3% in the period 1940-1944, 14.5% in 1935-1939, 13.4% in 1930-1934, 10.5% in 1925-1929, and 6.9% in 1920-1924; 19.9% were graduated prior to 1920. As might be expected, most—52.2%—of the physicians who were retired and not in practice were graduated prior to 1910.

The percentage in active private practice increases (part C) from a first low for the group who graduated before 1900 to a peak of 91.7 of those graduating in the period 1920-1924 and then declines to the second low of 25.7 for those who were graduated in 1945-1949. The percentage of general practitioners in each successive five-year graduation class declines rather steadily from a first high of 42.7 for the earliest group to a first low of 29.1 for the two graduation groups 1920-1929, then rises to the second high of 45.2 for the graduation group 1940-1944, and again falls to the second low of 24.4 for the 1945-1949 group. Those who were graduated during the 1940's had not had time to specialize by April, 1950.

In the footnote to table 1a, percentages by type of practice are shown for graduates of the 1940's excluding those who were interns or residents as of April, 1950. The exclusion of interns and residents decreases the total by almost one-fourth in the 1940-1944 group and by approximately three-fifths in the 1945-1949 group. The percentages in active private practice are raised by this exclusion from 69.5 and 25.7 to 89.7 and 65.7. Similar exclusions for earlier five-year graduation classes are not necessary because the number of interns and residents were so few.

As noted, M-94 contains tables similar to table 1a for each of the 71 medical schools. By using the percentages in table 1a, comparisons can be made among distributions of alumni of the 71 schools. In making such comparisons, care should be taken to note the influence of the distribution by five-year graduation classes, particularly the proportion of early and recent graduates upon the type of practice percentage of all alumni. Each medical school dean will probably prefer to compare the alumni of his school as to type of practice with those of one or more of the other schools or all 71 schools by each of the five-year graduation classes rather than by the total number of alumni of the school. Of course, if the school in question was not organized until, say after 1925, no comparison of the latter type can be made with the alumni of the older schools. It must be stressed, however, that the age distribution of alumni (as indicated by the five-year period of graduation) exercises a strong influence on the type of practice percentages of all alumni.

PRIVATE VERSUS PUBLIC SCHOOLS

As noted, the reason for so many tables in this study was the decision to present 71 tables in each of the eight series in M-94. A preliminary decision was made to divide the schools in two groups, private and public, and to present only pairs of tables. The results of this experiment for the type of practice categories are presented in table 9a of Bureau Bulletin 101. Despite the fact that many so-called private medical schools receive some assistance from federal and state governments, we have used the current, instead of the 1950, ownership classification of the Council on Medical Education and Hospitals of the American Medical Association; those classified as municipal schools are considered public schools for the present purpose. Accordingly, Long Island, Syracuse, and Southwestern were classified in our computations as public schools although they were classified as private schools in April, 1950. If the 1950 classification had been employed, the division between public and private schools would have been 28 and 43 instead of 31 and 40. Since the data are presented for the individual schools, the shift of these three schools can be made. It seems to us, however, that the current classification is more meaningful.

Of the 164,409 alumni, 97,636 (or 59.4%) were graduates of the 40 private medical schools, and 66,773 (or 40.6%) were graduates of the 31 public medical schools. Of all the alumni of the 31 public schools, 45.3% were graduates of the period 1920-1939; the corresponding percentages for the 40 private schools and the 71 schools, 45.2 and 45.3, were almost the same. Of the graduates prior to 1920, however, the percentages were 18.5 for the public schools and 20.9 for the private (19.9 of all 71 schools). This difference reflects the greater age of the private schools. Conversely, the graduates of 1940-1949 comprise a larger percentage of all alumni of the public than of all alumni of the private schools—36.2 versus 33.9; this reflects the recent ex-

PHYSICIANS LIVING IN THE UNITED STATES IN APRIL, 1950
Table 1a. - Distribution of Graduates of U. S. Approved 4 Year Medical Schools by 5 Year Graduation Groups and Type of Practice

Type of Practice (1)	1869 1899 (2)	1900 1904 (3)	1905 1909 (4)	1910 1914 (5)	1915 1919 (6)	1920 1924 (7)	1925 1929 (8)	1930 1934 (9)	1935 1939 (10)	1940 1944 (11)	1945 1949 (12)	Total (13)
A. - Number												
1. G.P.	1,824	1,865	2,738	3,048	2,763	3,318	5,005	6,944	8,289	13,579	6,627	56,000
2. P.T.S.	308	509	902	1,266	1,469	1,953	3,084	3,850	3,093	1,734	173	18,341
3. F.T.S.	653	1,055	1,907	2,870	3,812	5,184	7,569	9,232	10,003	5,551	186	48,022
3a. A.P.P.	(2,785)	(3,429)	(5,547)	(7,184)	(8,044)	(10,455)	(15,658)	(20,026)	(21,385)	(20,864)	(6,986)	(122,363)
4. Admin., etc.	12	23	44	69	76	68	121	108	112	122	58	813
5. FT Med. Sch.	10	15	53	87	111	154	183	200	202	411	132	1,558
6. Fed. Govt.	5	32	104	277	469	416	973	1,270	1,282	1,327	3,001	9,156
7. Ret. & NIP	1,463	970	890	629	421	295	245	217	246	530	460	6,366
8. Interns							3	2	6	114	8,487	8,612
9. Residents		2	1	1	3	6	31	169	622	6,631	8,075	15,541
Total	4,276	4,471	6,639	8,247	9,124	11,394	17,214	21,992	23,855	29,999	27,198	164,409
B. - Percentage Distribution by 5 Year Graduation Groups												
1. G.P.	3.3%	3.3%	4.9%	5.5%	4.9%	5.9%	8.9%	12.4%	14.8%	24.3%	11.8%	100.0%
2. P.T.S.	1.7	2.8	4.9	6.9	8.0	10.6	16.8	21.0	16.9	9.5	0.9	100.0
3. F.T.S.	1.4	2.2	4.0	6.0	7.9	10.8	15.8	19.2	20.8	11.5	0.4	100.0
3a. A.P.P.	(2.3)	(2.8)	(4.5)	(5.9)	(6.6)	(8.5)	(12.8)	(16.4)	(17.5)	(17.0)	(5.7)	100.0
4. Admin., etc.	1.5	2.8	5.4	8.5	9.3	8.4	14.9	13.3	13.8	15.0	7.1	100.0
5. FT Med. Sch.	0.6	1.0	3.4	5.6	7.1	9.9	11.7	12.8	13.0	26.4	8.5	100.0
6. Fed. Govt.	0.1	0.4	1.1	3.0	5.1	4.5	10.6	13.9	14.0	14.5	32.8	100.0
7. Ret. & NIP	23.0	15.2	14.0	9.9	6.6	4.6	3.9	3.4	3.9	8.3	7.2	100.0
8. Interns							†	†	0.1	1.3	98.6	100.0
9. Residents		†	†	†	†	†	0.2	1.1	4.0	42.7	52.0	100.0
Total	2.6	2.7	4.0	5.0	5.6	6.9	10.5	13.4	14.5	18.3	16.5	100.0
C. - Percentage Distribution by Type of Practice												
1. G.P.	42.7%	41.7%	41.2%	37.0%	30.3%	29.1%	29.1%	31.6%	34.7	45.2%	24.4%	34.1%
2. P.T.S.	7.2	11.4	13.6	15.3	16.1	17.1	17.9	17.5	13.0	5.8	0.6	11.1
3. F.T.S.	15.3	23.6	28.7	34.8	41.8	45.5	44.0	42.0	41.9	18.5	0.7	29.2
3a. A.P.P.	(65.2)	(76.7)	(83.5)	(87.1)	(88.2)	(91.7)	(91.0)	(91.1)	(89.6)	(69.5)	(25.7)	(74.4)
4. Admin., etc.	0.3	0.5	0.7	0.8	0.8	0.6	0.7	0.5	0.5	0.4	0.2	0.5
5. FT Med. Sch.	0.2	0.3	0.8	1.1	1.2	1.4	1.1	0.9	0.9	1.4	0.5	0.9
6. Fed. Govt.	0.1	0.7	1.6	3.4	5.1	3.6	5.6	5.8	5.4	4.4	11.0	5.6
7. Ret. & NIP	34.2	21.7	13.4	7.6	4.6	2.6	1.4	1.0	1.0	1.8	1.7	3.9
8. Interns							†	†	†	0.4*	31.2*	5.2*
9. Residents		0.1	†	†	0.1	0.1	0.2	0.7	2.6	22.1*	29.7*	9.5*
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0*	100.0*	100.0*

†Less than 0.1%

*Excluding interns and residents the corresponding percentages are: 1940-1944 - 58.4, 7.4, 23.9, (89.7), 0.5, 1.8, 5.7, and 2.3; 1945-1949 - 62.3, 1.6, 1.8, (65.7), 0.6, 1.2, 28.2, and 4.3; Total - 39.9, 13.1, 34.2, (87.2), 0.6, 1.1, 6.5, and 4.6.

pansion in the public schools. In part C of table 9a, however, the age factor is isolated by the division into the three graduation class groups. Although the percentages of general practitioners of the alumni of the middle graduation period, 1920-1939, are about equal for the public and private schools, the percentages for the public exceed those for private schools in the other periods—40.7 versus 35.4 in the earliest and 37.3 versus 33.9 in the latest period. The percentages of full-time specialists among the alumni of the private schools in all three periods were higher—33.7, 44.0, and 10.2 versus 27.7, 41.5, and 9.8. But the percentage of alumni in active private practice was identical, 74.4 of the alumni of the 31 public schools and the 40 private schools. The higher percentage of the alumni of the public schools in federal government service than alumni of the private schools, 6.0 versus 5.3, probably reflects the youth—the greater proportion of recent graduates—and military service of the alumni of the public schools.

In order to remove the confusion in this comparison of the alumni grouped into three graduation periods caused by the inclusion of interns and residents in the totals, they have been eliminated in part D of table 9a. The percentages of alumni of the 71 schools in active private practice, excluding interns and residents, were 82.4 of those who graduated before 1920, 91.7 of those who graduated in the period 1920-1939, 82.2 of those who graduated during the 1940's, and 87.2 of all of the alumni; the corresponding percentages with interns and residents included were 82.4, 90.7, 48.7, and 74.4. The corresponding percentages of alumni of the 40 private schools and the 31 public schools differ little. In fact, the principal effect of excluding interns and residents is, as might be expected, a lifting of the percentages for the other type of practice categories; for example, the percentages of general practitioners are raised to 39.9 from 34.1 for 71 schools, to 38.7 from 33.0 for the 40 private schools, and to 41.7 from 35.6 for the 31 public schools. (Another reason for presenting these data with interns and residents excluded is the defect in the count of these two categories, which is fully described in the appendix to Bulletin 101.) Even in the proportion of certified board members the difference between the alumni of 40 private and 31 public schools was not extremely great. The private schools, which had 59.4% of the alumni, had 63.7% of the specialty board diplomates.

These differences between the 31 public schools and the 40 private schools were not sufficiently great to warrant the substitution of the twofold classification of the 71 schools. This twofold grouping did, however, provide conclusive evidence that individual tables would be required for each of the 71 schools.

RANKS BY TYPE OF PRACTICE

In table 10, and in all other tables that show the rank and the name of each school, the schools are arranged in state order. The years of graduation of the alumni living in the United States in April, 1950, and the total number of alumni for each of the 71 schools are presented, along with the ranks, in table 10. Jefferson had the most alumni—5,742—and was assigned rank 1; Pennslyvania was assigned rank 2, with 5,462 alumni. Other top ranking schools were Illinois, in third place with 5,258; Harvard, in fourth place with 4,987; and Northwestern, in fifth place with 4,856. The middle five schools, ranking 34-38, were Cincinnati, Western Reserve, Vanderbilt, George Washington, and Marquette, with a range of 2,159 to 2,005 alumni. At the other extreme, those with the fewest alumni were the University of Chicago, Alabama, Southwestern, Bowman Gray, Chicago Medical, and Utah, with a range of 839 to 249. Although the lowest and highest five schools in the number of alumni broadly indicate the difference in the ages of these schools, it does not follow that a ranking according to the year of organization would be the same as this ranking according to the number of alumni as of April, 1950.

Table 11 (in Bulletin 101) presents the number of alumni in each type of practice category. The differences between the numbers of alumni are so great that the ranks presented in other tables are only for the percentage distribution, not for the number of alumni in each category. Accordingly, no special attention will be given to table 11. Tables 12 to 18 of Bulletin 101, showing the distribution by type of practice, are not reprinted herein. They present, in double columns, both the percentage and the rank of the percentage of each school for all alumni of the school and for the alumni of the school by five-year graduation classes for the period 1920-1949. The ranks only and for all alumni only are presented herein in columns (2) to (8) of table 28. Nevertheless, in our discussion of these type of practice distributions the ranks of the percentages for the top five, middle five, and the bottom five schools is given; in case of ties, the number is 4 or 6 or 7.

Meharry, Howard, Chicago Medical, Alabama, and College of Medical Evangelists ranked highest in the percentage of general practitioners, with a range of 78.7 to 50.1 [column (2), table 28, or columns (13) and (13a) of table 12 in Bulletin 101]. The middle five schools, ranking 34-38, were Pittsburgh, Albany, Maryland, Iowa, and Northwestern, with a range of 35.2 to 34.0%. At the other extreme, the schools with very low percentages of general practitioners were Cornell, Yale, Rochester, Harvard, and Hopkins, with percentages ranging from 22.1 to 13.4. For convenience, the percentage for the 71 schools combined and the ranges in percentages are presented in the bottom two rows of table 28 (and table 12). In this report, deviation above or below 34.1%—the percentage of general practitioners in the entire group of 164,409 alumni of the 71 schools—implies no particular judgment on my part regarding the purposes and objectives of the school as revealed by the proportion of alumni who were general practitioners. Rather, it is my purpose to present the statistics. There are so many variables involved that medical educators may experience considerable difficulty in making any broad generalizations. This summary must omit full comments on the rank and percentage in the remaining six pairs of columns of table 12 to 18 for five-year graduation classes. The data presented for each of the five-year graduation classes in the period 1920-1949 may, however, actually have more significance than the ranks and percentages shown in the first pair of columns for all alumni of the schools. The fact has already been established that the percentages of general practitioners were

highest in the most recent graduation classes and in the earliest graduation classes (part C, table 1a). Some of the differences in ranks are undoubtedly due to the age distribution of the alumni. In these rankings for the five-year graduation groups the instability of small numbers is also manifested. The lowest rank is less than 71 in many of these columns because there were no alumni who graduated from a particular school in a particular five-year period. For example, only 64 schools had alumni from the graduating classes of 1925-1929; Hopkins, with the rank of 64, had the lowest percentage of general practitioners.

In some respects the alumni who graduated in the 1930's provide a clearer comparison of the alumni of the schools than do the rankings for all alumni. Certainly the picture is not clear for those who graduated in the 1945-1949 period, and it is not too clear for those who graduated during the World War II period 1940-1944. Comments in this summary must be almost entirely restricted to the ranks of percentages for all (total) alumni of the school.

PART-TIME AND FULL-TIME SPECIALISTS

Of the 164,409 alumni of the 71 schools, 11.1% were part-time specialists; the percentages of the alumni of the various schools ranged from a high of 15.7 to a low of 0.7 [bottom row, column (3), table 28, and of table 13 of Bulletin 101]. The five schools that had the highest percentages of alumni in the part-time specialist category were Stritch, Tufts, Chicago Medical, Texas, and Emory, with percentages ranging from 15.7 to 14.2. The middle five schools, ranking 34-38, were Louisville, Indiana, Western Reserve, Nebraska, and Marquette, with a range of 11.6 to 11.3%. The five schools with the lowest percentages were Meharry, University of Chicago, Southwestern, Utah, and Bowman Gray, with a range of 3.9 to 0.7. Again, those who graduated at least 10 years prior to 1950 may warrant special attention by medical educators; for example, Hahnemann had the second highest percentage of part-time specialists of the graduates of 1935-1939 but was outranked by five schools in the percentage of all alumni who were part-time specialists.

Physicians classify themselves as full-time specialists, and the Directory Department accepts such self-declaration. Many are not diplomates of any American Board. Conversely, it is well known that a rather surprising number of diplomates do not classify themselves as full-time specialists. Of all graduates of the 71 schools, 29.2% did classify themselves as full-time specialists, with the percentages of the alumni of each school ranging from 48.9 to 0.4 [bottom row, column (4), table 28, and of table 14 of Bulletin 101]. The five schools with the highest percentages of alumni who were self-declared full-time specialists were Hopkins, Harvard, Columbia, Cornell, and Yale, with the percentages ranging from 48.9 to 40.0. The middle five schools, ranking 34-38, were Wayne, Duke, Ohio State, George Washington, and Wisconsin, with a range of 26.9 to 26.8%. The five schools with the lowest percentage of alumni in this category were Southwestern, Howard, Bowman Gray, Meharry, and Utah, with percentages ranging from 6.0 to 0.4. In this instance, Utah illustrates clearly the need to consider the alumni by five-year graduation groupings, because all of the alumni of Utah graduated so recently (since 1940).

TABLE 10.—*Number of Graduates and Rank in Array of Alumni of the Seventy-One U. S. Approved Four-Year Medical Schools*

School and Period in Which Alumni Graduated	Rank (1)	No. (2)
Alabama—California		
Alabama—1869-1924, 1945-1949	67	394
Arkansas—all years	50	1,517
California—all years	40	1,946
Southern California—1869-1909, 1930-1949	65	879
Stanford—1910-1949	55	1,400
Evangelists—1910-1949	39	1,976
Colorado—Georgia		
Colorado—all years	54	1,428
Yale—all years	49	1,532
Georgia—all years	57	1,369
Emory—1869-1899, 1910-1949	41	1,869
Illinois		
University of Chicago—1925-1949	66	839
Northwestern—all years	5	4,856
Illinois—all years	3	5,258
Chicago Medical—1915-1934, 1945-1949	70	250
Stritch—1915-1949	24	2,542
Indiana—Louisiana		
Indiana—1905-1949	18	3,094
Iowa—all years	23	2,574
Kansas—1905-1949	44	1,826
Louisville—all years	16	3,170
Tulane—all years	9	4,053
Louisiana—1930-1949	61	1,112
Maryland—Massachusetts		
Maryland—all years	14	3,425
Johns Hopkins—all years	17	3,118
Harvard—all years	4	4,987
Boston—all years	48	1,637
Tufts—all years	11	3,713
Michigan—Nebraska		
Michigan—all years	8	4,214
Wayne—all years	33	2,187
Minnesota—all years	10	3,808
Washington—all years	19	2,989
St Louis—1900-1949	12	3,592
Nebraska—all years	32	2,239
Creighton—all years	42	1,803
New York		
Columbia—all years	6	4,419
Albany—all years	59	1,301
Buffalo—all years	30	2,349
Long Island—all years	13	3,534
New York Medical—all years	29	2,424
Syracuse—all years	51	1,495
New York University—all years	7	4,351
Cornell—all years	27-28	2,432
Rochester—1925-1949	63	1,002
North Carolina—Oregon		
Bowman Gray—1940-1949	69	275
Duke—1930-1949	62	1,003
Western Reserve—all years	35	2,101
Ohio State—1905-1949	27-28	2,432
Cincinnati—1910-1949	34	2,159
Oklahoma—1910-1949	53	1,461
Oregon—all years	47	1,639
Pennsylvania		
Pennsylvania—all years	2	5,402
Jefferson—all years	1	5,742
Woman's—all years	64	992
Hahnemann—all years	15	3,186
Pittsburgh—all years	31	2,340
Temple—1905-1949	22	2,656
South Carolina—Texas		
South Carolina—all years	58	1,365
Vanderbilt—all years	36	2,052
Tennessee—all years	20	2,530
Meharry—all years	45	1,774
Texas—all years	25	2,533
Baylor—1900-1949	46	1,719
Southwestern—1940-1949	68	352
Utah—Virginia		
Utah—1940-1949	71	249
Vermont—all years	56	1,378
University of Virginia—all years	43	1,842
College of Virginia—all years	21	2,674
Wisconsin—District of Columbia		
Wisconsin—1925-1949	60	1,169
Marquette—1905-1949	38	2,005
George Washington—all years	37	2,020
Georgetown—all years	26	2,460
Howard—all years	52	1,476

Source: Table 1 series of publication M-94, Bureau of Medical Economic Research. See these series for five-year graduation periods with no alumni.

N.B.—Only four schools had gaps in their graduation classes for the purposes of this study—Alabama, Southern California, Emory, and Chicago Medical. See appendix to Bulletin 101. In some of the remaining tables it was necessary to abbreviate the name of the school; hence there are some abbreviations of school names in this table.

School	Total Alumni (1)	Type of Practice: G.P. (2)	P.T.S. (3)	F.T.S. (4)	A.P.P. (5)	F.T. Med. Sch. (6)	Fed. Govt. (7)	Ret. & N.I.P. (8)	Same State of Residence as School of Graduation: All Alumni (9a)	A.P.P. (9b)	Population Size of City: Under 5,000 (10a)	5,000-24,999 (10b)	25,000-249,999 (10c)	Over 250,000 (10d)	Self-Declared Part-: Surgery (11a)	Obstetrics (11b)	Gynecology (11c)
Alabama—California																	
Alabama	67	4	56-57	65	37	..	62-64	2	14	15	1	9	52-53	64	26	65-66	..
Arkansas	50	13	8-9	62	40-41	64-68	6	37-38	46	45	8-9	3	18	66	25	18	38-41
California	40	52	55	20	58	11-12	49-50	9	2	1	57	63	58	4	12-13	68	59
Southern California	65	27	64-65	52	62	64-68	10	19	1	2	69	45	52-53	15	51	47-48	4
Stanford	55	57	50	9	47	8	40-42	45-47	3	3	65	40	36	18	3	56-58	23-24
Evangelists	39	5	11	60	3	..	62-64	64-67	18	20	11	5-6	38	56	24	45	9
Colorado—Georgia																	
Colorado	54	55	33	23	53	26-32	5	43-44	42	40	41	27	57	23	29-30	30	38-41
Yale	49	68	59	5	59	7	49-50	15-18	58	57	53	69	1	51	53	36-38	12-13
Georgia	57	20	17	51	44	34-37	20-23	39-40	23	22	4	18-19	11	68	5	40	10
Emory	41	50	4-5	17	18	44-56	20-23	58-60	45	47	13	10	32	54	17	9-10	20-21
Illinois																	
University of Chicago	66	54	68	46-47	67	2	7	39-40	59	62	67	65	50-51	5	58	63-64	..
Northwestern	5	38	24-25	16	8-9	9-10	34-35	12-13	60	60	36-37	25-26	24	44	11	42	45
Illinois	3	28	18	48	36	57-63	15-17	15-18	33	33	40	46-49	45	26	32-33	43-44	22
Chicago Medical	70	3	3	66	1	44-56	71	5	4	5	47	70-71	71	1	65	67	5
Stritch	24	7	1	58	4	64-68	34-35	61	30-31	34	55	53	60-61	11	22	41	7-8
Indiana—Louisiana																	
Indiana	18	21-24	35	33	23-24	14-18	36-39	54-57	20	16-17	21	29-31	29	43	45	7	60
Iowa	23	37	26-28	24-25	23-24	14-18	15-17	30	44	41	10	32	12	63	21	26-29	28-30
Kansas	44	31	46	40	45	20-24	14	64-67	48	49	14	14	20	60	10	26-29	64
Louisville	16	11	34	50	15-17	57-63	31	27-28	52-54	51-52	2	29-31	55	48-49	27-28	11	53-56
Tulane	9	46-47	12-14	26-27	35	14-18	46-48	25-26	57	59	29-31	28	28	42	2	43-44	14-17
Louisiana	61	12	64-65	64	65	38-43	44-45	62-63	22	29	22	41-43	30	38	8-9	6	..
Maryland—Massachusetts																	
Maryland	14	36	31-32	21-22	19	44-56	33	29	51	56	23	46-49	49	29	49	31	25-27
Johns Hopkins	17	71	61	1	57	1	59	4	67-68	68	66	67	31	8	43	61	38-41
Harvard	4	70	58	2	55-56	4	53-54	10	52-54	53	61	64	23	22	18-19	34	53-56
Boston	48	51	30	32	55-56	34-37	28-30	6	43	44	38-39	33	19	48-49	56-57	8	46-49
Tufts	11	44	2	21-22	14	64-68	44-45	41-42	27	30	49-50	50-52	7	52-53	46	23	14-17
Michigan—Nebraska																	
Michigan	8	63	44-45	6	30	14-18	67	7	41	42	48	44	13	45	31	35	53-56
Wayne	33	18	19	34	10-12	57-63	66	20	5	7	52	56	63	6	42	20	11
Minnesota	10	15	48	31	15-17	5	20-23	21-24	29	31	15-16	29-31	65	31	6	60	46-49
Washington	19	58	44-45	12	48	14-18	12	34	52-54	54	45	38	39	24	7	56-58	35-37
St. Louis	12	21-24	8-9	46-47	20-22	38-43	32	49-50	64	64	34-35	41-43	48	25	18-19	36-38	42-44
Nebraska	32	21-24	37-38	42-43	34	19	9	48	61-62	58	8-9	18-19	47	46	8-9	25	42-44
Creighton	42	6	23	53	5	44-56	18-19	51	67-68	67	15-16	25-26	44	40	14	19	33-34
New York																	
Columbia	6	66	52	3	38-39	20-24	65	3	25	24-25	58	54	60-61	9-10	37	52-54	35-37
Albany	59	35	39-40	26-27	27	44-56	56-58	21-24	9	8	17-18	20-21	2	67	52	39	46-49
Buffalo	30	40	26-28	24-25	28-29	44-56	51-52	31-32	7	9	42	50-52	68	7	34	26-29	35-37
Long Island	13	46-47	10	18	15-17	44-56	46-48	35-36	10	14	64	17	70	13	60	46	25-27
New York Medical	29	17	21-22	55	46	44-56	56-58	45-47	17	18	63	59	64	14	61	59	42-44
Syracuse	51	53	41-42	10	20-22	26-32	60	31-32	11	11	28	39	3	61	47	21	63
New York University	7	60	29	8	20-22	38-43	53-54	53	16	19	68	58	69	3	44	63-64	18
Cornell	27-28	67	54	4	51-52	26-32	55	15-18	24	23	59-60	50-52	42	19	36	50	19
Rochester	63	69	62-63	42-43	68	6	36-39	33	40	46	62	60-61	40	9-10	41	56-58	57-58
North Carolina—Oregon																	
Bowman Gray	69	14	71	69	69	44-56	2	70-71	39	32	12	55	17	58	..	..	..
Duke	62	59	66	35-38	66	26-32	20-23	64-67	65	66	49-50	35	4	55	29-30	62	..
Western Reserve	35	61	36	15	54	26-32	61	21-24	21	21	56	57	37	17	40	12-13	62
Ohio State	27-28	21-24	12-14	35-38	10-12	44-56	15-17	54-57	12	12	25	37	41	33	59	1-2	57-58
Cincinnati	34	42	49	14	31	25	56-58	54-57	28	27	54	60-61	34	21	56-57	9-10	50
Oklahoma	53	32	15	54	50	38-43	4	69	30-31	26	20	5-6	6	65	23	3	53-56
Oregon	47	29	51	45	51-52	13	13	41-42	35-36	37	36-37	34	62	20	27-28	65-66	20-21
Pennsylvania																	
Pennsylvania	2	62	41-42	7	28-29	9-10	62-64	8	35-36	39	43-44	36	26	37	48	26-29	33-34
Jefferson	1	39	16	19	10-12	34-37	51-52	21-24	37	38	26	11	21	52-53	50	16	38-41
Woman's	64	41	43	56	63	69	70	1	49	50	33	24	43	35	68	5	1
Hahneman	15	9	6-7	61	7	57-63	36-39	37-38	34	35	17-18	8	33	47	64	22	7-8
Pittsburgh	31	34	47	30	38-39	34-37	40-42	27-28	8	10	29-31	2	66-67	28	63	1-2	28-30
Temple	22	16	24-25	59	49	44-56	18-19	62-63	26	24-25	29-31	15	46	36	62	12-13	61
South Carolina—Texas																	
South Carolina	58	26	31-32	49	42	20-24	36-39	25-26	19	16-17	5	1	14	71	12-13	17	51
Vanderbilt	36	56	26-28	13	43	20-24	28-30	14	63	63	24	7	8	62	15-16	32-33	31-32
Tennessee	20	10	20	57	13	57-63	26-27	49-50	55	55	3	20-21	35	57	1	52-54	25-27
Meharry	45	1	67	70	2	64-68	69	54-57	71	71	70	23	22	30	67	49	2
Texas	25	45	4-5	28	32	20-24	40-42	43-44	6	6	38-39	22	27	39	4	55	23-24
Baylor	46	33	6-7	29	8-9	38-43	26-27	58-60	13	13	27	12	59	32	15-16	36-38	12-13
Southwestern	68	48	69	67	70	57-63	8	68	15	4	51	13	66-67	16	..	..	..
Utah—Virginia																	
Utah	71	65	70	71	71	44-56	1	45-47	50	43	43-44	70-71	10	41	..	..	..
Vermont	56	19	21-22	44	25	38-43	43	11	66	65	7	4	16	69	39	32-33	28-30
University of Virginia	43	64	56-57	11	61	11-12	11	15-18	56	51-52	34-35	46-49	5	59	32-33	47-48	14-17
College of Virginia	21	25	39-40	39	33	26-32	24-25	35-36	47	48	6	16	9	70	54	4	14-17
Wisconsin—Dist. of Columbia																	
Wisconsin	60	49	60	35-38	64	3	46-48	52	38	36	32	46-49	15	50	20	52-54	6
Marquette	38	8	37-38	63	40-41	44-56	28-30	70-71	32	28	19	66	50-51	27	35	14-15	52
George Washington	37	43	53	35-38	60	33	3	12-13	61-62	61	46	62	54	12	55	14-15	31-32
Georgetown	26	30	12-14	41	26	26-32	24-25	64-67	69	69	59-60	41-43	25	34	38	24	46-49
Howard	52	2	62-63	68	6	57-63	68	58-60	70	70	71	68	56	2	66	51	8
71 Schools	**164,409**	**34.1%**	**11.1%**	**29.2%**	**74.4%**	**0.9%**	**5.6%**	**3.9%**	**38.9%**	**51.0%**	**14.4%**	**15.4%**	**28.0%**	**40.4%**	**40.1%**	**8.1%**	**2.9%**
Range	**5,742-249**	**78.7%-13.4%**	**15.7%-0.7%**	**48.9%-0.4%**	**87.6%-25.7%**	**4.2%-0.0%**	**10.1%-0.4%**	**21.4%-1.1%**	**86.8%-9.9%**	**91.9%-9.8%**	**38.1%-4.4%**	**24.7%-7.2%**	**46.3%-6.8%**	**74.0%-10.7%**	**55.7%-0.0%**	**14.5%-0.0%**	**22.2%-0.0%**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10a)	(10b)	(10c)	(10d)	(11a)	(11b)	(11c)

* Less than 0.1%. The large number of blank entries under internal medicine in column (11e) reflects the fact that no part-time specialists among the alumni of 67 of the 71 schools checked internal medicine. Since this is somewhat of an anomaly involving only four physicians, it may be an error.

† The percentage used in determining the rank of the school was the percentage of all the school's alumni as of April, 1950 for the ranks in columns (1) to (10d), and column (13). The ranks in the other columns are based on the percentage of the alumni of the school in the category—the percentage of the alumni who were part-time specialists in columns (11a) to (11f), of its alumni who were full-time specialists in columns (12a) to (12f), the percentage who were diplomates of American Boards in columns (13a) to (13k); that is, the exceptions to the "all alumni" percentage are the ranks of self-

Time Specialty			Self-Declared Full-Time Specialty						American Boards											
Obstetrics, Gynecology (11d)	Internal Medicine (11e)	Pediatrics (11f)	Surgery (12a)	Obstetrics (12b)	Gynecology (12c)	Obstetrics, Gynecology (12d)	Internal Medicine (12e)	Pediatrics (12f)	All Boards (13)	A.B. 1 Pediatrics (13a)	A.B. 2 Psychiatry & Neurology (13b)	A.B. 3 Orthopaedic Surgery (13c)	A.B. 5 Radiology (13d)	A.B. 7 Obstetrics and Gynecology (13e)	A.B. 8 Internal Medicine (13f)	A.B. 9 Pathology (13g)	A.B. 10 Ophthalmology (13h)	A.B. 11 Otolaryngology (13i)	A.B. 12 Surgery (13j)	Other Bds. (13k)
68	..	2	66	7	..	69	65	52-54	64-65	62	42	29-30	7	30-31	50	..	3	15-16	15	43-44
10	..	36-39	64	10-13	18	46	55-57	65-66	61	67	1	50	3	56	65	20	35-37	7	59	32-33
8	..	59	54	46-53	39-42	12-13	18	28-29	14	28-29	53	2	64	11-14	18	31-34	63-64	62	28-29	8
3	..	61-63	67	8-9	..	4-5	33	43-44	44-46	60	66	31-32	14-15	3	46-47	60-61	9	36	24-26	4
14	..	65	42-45	58-61	33-38	24-26	16	33-34	9	37	48	37-38	50	11-14	19	23	39-40	43-45	11	38
21-22	..	67	12	58-61	39-42	9-10	60	63	57	66	33-35	22	16-19	11-14	49	3	68	39	31	2
31-32	..	16-17	30	24-27	51-59	65-67	35-36	52-54	20	34	6	27	28	65-66	26	15-16	42-43	49-50	56-57	26
52-53	..	9	28	46-53	21-25	39-40	44	4	4	2	26-27	41-42	65	11-14	48	11-12	46-48	63	8	66
50-51	..	6	3-4	14-16	26-32	22-23	46	14	60	25	44	12-13	61	8-10	43-44	24-25	55-56	18	33-34	23-24
4	..	43	27	32-37	8-10	21	25-26	28-29	33-34	14-15	59-60	51-53	54-55	19	14	45-46	22	53-54	13	47-49
12	..	14	59	..	39-42	59-60	2	43-44	23	39	5	16-17	20-22	47	2	14	67	68	35	50
24-26	..	60	10	54-57	45-50	15-17	15	48-49	16-17	40-42	55-58	16-17	51	8-10	16	47-48	28-29	53-54	12	45-46
42-43	..	54	34-35	46-53	39-42	31-32	47-50	26-27	39	13	11-12	37-38	57	32	53	38-39	11-12	23	40-41	51-52
6-7	..	44-45	57-58	..	1	49-53	70	..	66	..	..	..	1	15	..	..	1	40-41	..	29-31
24-26	..	46-47	31-32	14-16	21-25	19-20	62	19-20	58	32-33	10	44	12	2	66	52-54	2	38	60	63
60	..	61-63	31-32	20-23	26-32	68	39	50-51	35	57-58	30-31	19-20	25-26	64	40	26	7	6	56-57	19
19	..	46-47	40	54-57	45-50	63-64	55-57	35-36	18	26-27	40	15	38	61	51	31-34	31	1	37	58-59
61	..	64	42-45	..	51-59	34	5	59-60	36-37	63	47	31-32	32-33	42-44	27	9	8	46-47	17-18	32-33
52-53	..	34	9	20-23	60	35-36	41-42	55-56	53	36	32	28	11	40-41	41	55	46-48	9-10	30	40
20	..	49	13	46-53	11-15	7-8	52-53	39-40	29	31	63	64	52	8-10	30	37	35-37	5	24-26	20
62-64	..	11	56	46-53	..	11	54	2	64-65	16-17	67	3	37	20	35	4	52	43-45	6	67
62-64	..	8	6-8	4-5	11-15	55-56	35-36	45-46	40	43-45	25	25-26	45-46	50-52	20	27-28	42-43	29	19-20	41-42
48	..	4	5	17-18	3	61	4	7	1	8	49	25-26	68	25-27	6	38-39	59-61	67	3	58-59
45-46	..	40	1	32-37	33-38	41-43	3	21-22	2	16-17	59-60	19-20	66	39	1	50-51	66	65	1	64
38-39	1	36-39	65	19	26-32	55-56	47-50	37	41	51	14	46-49	54-55	50-52	54	8	13-14	2	62-63	18
41	..	20-21	52-53	20-23	33-38	30	61	39-40	33-34	40-42	2	33-34	8	17-18	61	40	21	20-21	62-63	55-56
33-37	..	44-45	21	32-37	51-59	24-26	52-53	26-27	7	23	36-38	14	58	17-18	45	56-57	28-29	37	32	12
11	..	48	6-8	32-37	..	4-5	40	65-66	44-46	48	9	65	29	28-29	22	31-34	32	27	48	39
17	..	55-57	23	46-53	45-50	49-53	30-31	24-25	16-17	19	45	46-49	9-10	42-44	21	30	11-12	61	19-20	61
44	3-4	20-21	37	46-53	33-38	14	22	11	10	9-10	50	41-42	27	25-27	31	41	35-37	55	14	54
33-37	..	58	14	38-45	45-50	45	17	55-56	48	59	33-35	43	30-31	48-49	24-25	35-36	23-24	19	42	10-11
40	..	55-57	62-63	58-61	45-50	31-32	37-38	48-49	27	50	26-27	7	24	53	43-44	18-19	6	32	58	34-36
31-32	..	61-63	22	..	51-59	41-43	32	61	55-56	53-54	55-58	29-30	6	57-59	34	13	13-14	20-21	45	25
50-51	3-4	10	2	54-57	21-25	39-40	9-10	15	3	11	51-52	36	63	25-27	7	52-54	59-61	59	5	34-36
58	..	42	6-8	1	5	65-67	47-50	62	42-43	35	3	59-62	43-44	30-31	56	15-16	39-40	43-45	27	34-36
67	..	36-39	20	24-27	33-38	49-53	37-38	52-54	28	57-58	20-21	39-40	41	57-59	28-29	43	17-18	22	21-23	16
29	..	3	61	38-45	33-38	6	21	17	15	14-15	33-35	39-40	30-31	4-5	17	45-46	33-34	34-35	65-66	43-44
16	..	19	51	28-31	51-59	18	58	21-22	49	26-27	11-12	59-62	16-19	40-41	36	58-59	19-20	15-16	64	10-11
66	..	23	46	3	19-20	35-36	27	32	12-13	18	23-24	51-53	43-44	23	32	44	4	31	39	65
24-26	..	15	38-39	54-57	21-25	27-28	6	33-34	8	21-22	41	46-49	53	7	3	42	46-48	42	49-50	60
56-57	..	29-31	17	58-61	26-32	27-28	12	12	5-6	5-7	36-38	45	67	33	4	50-51	63-64	58	9	51-52
30	..	12-13	41	28-31	43-44	9-10	7	8-9	24-25	9-10	65	12-13	34	24	5	10	65	66	21-23	47-49
..	..	..	..	..	..	..	1	10	69	..	..	..	..	..	..	..	..	..	..	..
42-43	..	18	55	32-37	26-32	44	8	8-9	30	30	55-58	6	25-26	36-38	8	47-48	57-58	56	33-34	23-24
21-22	..	29-31	11	14-16	..	19-20	13-14	19-20	12-13	20	61	46-49	23	6	9-10	63-64	59-61	52	17-18	29-31
33-37	..	35	25-26	24-27	19-20	49-53	34	68-69	44-46	53-54	55-58	8	35-36	34-35	24-25	56-57	17-18	33	46	6
27	..	16-17	42-45	10-13	11-15	57	11	6	21	4	30-31	51-53	47	55	23	63-64	49	46-47	24-26	27-28
33-37	..	55-57	33	38-45	8-10	62	66	68-69	55-56	65	18	9	20-22	68	62-63	65	15-16	17	55	1
9	..	68	57-58	..	51-59	3	55-57	35-36	31-32	43-45	17	1	59	60	55	11-12	25	28	49-50	47-49
65	..	7	15-16	32-37	26-32	29	20	42	5-6	38	54	54-55	42	28-29	12	27-28	30	49-50	7	57
54	..	25-26	19	20-23	11-15	37-38	30-31	58	24-25	49	22	58	48-49	36-38	33	49	26-27	3	21-23	41-42
2	..	1	69	46-53	2	1	69	3	54	1	4	..	9-10	1	67	1	62	48	67	55-56
45-46	..	28	49-50	28-31	16-17	41-43	41-42	64	63	55-56	7	59-62	16-19	50-52	64	22	45	4	54	5
59	..	36-39	47-48	38-45	8-10	59-60	25-26	50-51	31-32	61	13	57	32-33	42-44	42	6-7	10	25-26	53	22
49	..	5	49-50	8-9	51-59	22-23	28-29	45-46	52	52	16	21	5	45-46	58	24-25	19-20	13	44	62
62-64	..	22	36	38-45	45-50	58	68	18	50	5-7	15	11	48-49	67	59-60	6-7	23-24	57	65-66	7
55	..	27	3-4	6	43-44	63-64	51	5	19	3	51-52	59-62	60	63	39	18-19	38	30	10	29-31
47	..	50-52	42-45	2	16-17	47-48	47-50	30-31	62	12	23-24	5	14-15	54	59-60	60-61	41	14	51-52	27-28
1	..	66	25-26	4-5	4	2	43	23	68	5-7	62	23	2	62	38	2	57-58	64	2	..
18	..	53	34-35	28-31	11-15	49-53	28-29	16	26	24	28-29	54-55	39-40	45-46	28-29	31-34	26-27	34-35	36	21
5	2	50-52	38-39	38-45	6	15-17	45	24-25	42-43	46	43	4	39-40	65-66	37	17	44	51	28-29	9
..	..	..	68	..	..	12-13	59	1	70	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
56-57	..	32	47-48	24-27	..	54	67	38	38	21-22	8	33-34	20-22	57-59	62-63	35-36	15-16	9-10	43	53
38-39	..	33	24	38-45	51-59	47-48	13-14	30-31	11	32-33	64	63	13	36-38	15	62	53	24	4	37
28	..	24	15-16	17-18	21-25	37-38	24	59-60	47	55-56	28-29	24	62	48-49	13	58-59	33-34	8	16	45-46
6-7	..	50-52	60	..	..	33	19	57	22	47	19	10	35-36	34-35	9-10	52-54	51	60	47	13
13	..	41	18	..	..	24-26	63-64	67	59	64	20-21	18	45-46	21-22	52	5	50	40-41	51-52	3
23	..	12-13	52-53	38-45	26-32	7-8	9-10	41	36-37	43-45	39	56	56	16	11	29	55-56	25-26	38	14-15
15	..	29-31	29	10-13	51-59	15-17	23	47	51	40-42	46	35	16-19	4-5	46-47	21	54	11-12	61	14-15
33-37	..	25-26	62-63	10-13	7	65-67	63-64	13	67	28-29	36-38	..	4	21-22	57	..	5	11-12	40-41	17
10.3%	*	**7.4%**	**16.5%**	**0.8%**	**0.7%**	**7.5%**	**19.0%**	**7.6%**	**15.4%**	**9.5%**	**8.7%**	**4.2%**	**8.4%**	**8.4%**	**17.8%**	**4.4%**	**7.5%**	**9.8%**	**12.1%**	**9.2%**
27.1%-0.0%	**0.5%-0.0%**	**22.2%-0.0%**	**24.3%-0.0%**	**2.9%-0.0%**	**3.0%-0.0%**	**13.3%-0.0%**	**44.5%-0.0%**	**18.9%-0.0%**	**37.1%-0.0%**	**21.4%-0.0%**	**22.3%-0.0%**	**12.1%-0.0%**	**40.0%-0.0%**	**13.5%-0.0%**	**25.2%-0.0%**	**10.1%-0.0%**	**30.0%-0.0%**	**18.0%-0.0%**	**23.6%-0.0%**	**22.5%-0.0%**
(11d)	(11e)	(11f)	(12a)	(12b)	(12c)	(12d)	(12e)	(12f)	(13)	(13a)	(13b)	(13c)	(13d)	(13e)	(13f)	(13g)	(13h)	(13i)	(13j)	(13k)

declared part-time and full-time specialists and the individual American Boards. The number of part-time and full-time specialists who checked each of the 33 specialties is presented in tables 4a and 5a of publication M-94. The four most popular specialties checked by full-time specialists were internal medicine, surgery, pediatrics, and obstetrics, gynecology (combined); to complete the latter, the separate specialties, obstetrics and gynecology, were added—instead of the fifth and sixth most popular, OALR and Oph.—to the four, making a total of six specialties. Accordingly, the sum of the percentages for the 71 schools at the bottom of columns (11a) to (11e) and of columns (12a) to (12f) is less than 100.0. For comparative purposes, the same six specialties were selected for the part-time specialists in our tables.

ACTIVE PRIVATE PRACTICE

The sum of the numbers of general practitioners, part-time specialists, and full-time specialists is the total number of alumni in active private practice. For the 71 schools the percentage was 74.4, with a range of 87.6 to 25.7 for the individual schools [bottom row, column (5), table 28, and of table 15 of Bulletin 101]. The five schools with the highest percentages of their alumni in active private practice were Chicago Medical, Meharry, College of Medical Evangelists, Stritch, and Creighton, with percentages ranging from 87.6 to 80.9. The middle six schools, ranking 34-39, were Nebraska, Tulane, Illinois, Alabama, Columbia, and Pittsburgh, with a range of 75.0 to 74.3. The five schools with the lowest percentages were University of Chicago, Rochester, Bowman Gray, Southwestern, and Utah, with a range of 58.1 to 25.7. The ranking of University of Chicago in this particular category should be examined in relation to its relatively short life; for example, its rank for the alumni who graduated in 1945-1949 was 15th. The same observation also applies to a number of other schools.

FULL-TIME MEDICAL SCHOOL STAFF

Only 0.9% of the alumni of the 71 schools were engaged in full-time medical school teaching, with the range from 4.2 to 0.0% for the individual schools [bottom row, column (6), table 28, and of table 16 of Bulletin 101]. The five schools with the highest percentages were Hopkins, University of Chicago, Wisconsin, Harvard, and Minnesota, with a range from 4.2 to 2.7. The middle five schools, ranking 33-37, were George Washington, Georgia, Boston, Jefferson, and Pittsburgh, with a range of 0.7 to 0.6%. Listing the five schools with the lowest percentage of their alumni in this category would be misleading, because two of them had no alumni in this category and the numbers were quite small.

FEDERAL GOVERNMENT

Of the 164,409 alumni, 5.6% were classified as being in some branch of federal government service in April, 1950, with a range from 10.1 to 0.4% [bottom row, column (7), table 28, and of table 17 of Bulletin 101]. The five schools with the highest percentages of their alumni in federal government service were Utah, Bowman Gray, George Washington, Oklahoma, and Colorado, with a range of 10.1 to 8.7. The middle seven schools, ranking 33-39, were Maryland, Northwestern, Stritch, Indiana, Rochester, Hahnemann, and South Carolina, with a range of 5.8 to 5.6%. The five schools with the lowest percentages were Michigan, Howard, Meharry, Woman's, and Chicago Medical, with a range of 3.3 to 0.4.

RETIRED AND NOT IN PRACTICE

It has not been possible for the Directory Department to obtain from physicians the information required to separate all those not in practice from those retired. There were 3.9% of the alumni in this combined category, with a range of 21.4 to 1.1% [bottom row, column (8), table 28, and of table 18 of Bulletin 101]. It should be obvious that the proportion of alumni who graduated many years ago is an important variable in determining the over-all percentage of alumni in this category in April, 1950. The five schools with the highest percentages were Woman's, Alabama, Columbia, Hopkins, and Chicago Medical, with a range of 21.4 to 6.8. The middle five schools, ranking 34-38, were Washington, Long Island, Medical College of Virginia, Arkansas, and Hahnemann, with a range of 3.4 to 3.2%. The four schools with the lowest percentages were Southwestern, Oklahoma, Marquette, and Bowman Gray, with a range of 1.4 to 1.1.

LIVING IN THE SAME STATE

Over the years there has been a considerable amount of interest in the proportion of graduates of a given medical school who remained in that state after graduation. The question is raised regarding all alumni, as well as regarding those alumni in the active private practice category. Table 19 (9 pages of Bulletin 101) presents for each of the 71 medical schools a pair of columns showing the number and percentage of all alumni residing in the 48 states, with regional totals. For example, 32.8% of the Yale alumni were living in Connecticut and 18.7% in New York; of the Colorado alumni, 45.0% were living in Colorado and 15.5% in California. There are many comments that could be made on the findings revealed in table 19, but most of these comments would be of local interest to a medical school faculty, a state legislature, and a state licensure board. The data in table 19 are presented in the last pair of columns in the table 8 series of publication M-94, which also include data for each type of practice category.

The data for all alumni in table 19 for only the state in which the medical school is located are presented in table 20. For the 71 schools as a group in April, 1950, 38.9% of the alumni were residing in the state in which their medical school is located. The range for the individual schools in percentages of the alumni residing in the state in which their school is located was from 86.8 to 9.9. The five schools that had the highest percentage of their alumni living in the state in which the school is located were Southern California, California, Stanford, Chicago Medical, and Wayne, with a range of 86.8 to 77.4. (It might be noted that for many years only one or two states would issue a license to a graduate of the Chicago Medical School.) The middle five schools, ranking 34-38, were Hahnemann, Oregon, Pennsylvania, Jefferson, and Wisconsin, with a range of 49.9 to 46.0%. The five schools with the lowest percentages of alumni living in the state in which the school is located were Hopkins, Creighton, Georgetown, Howard, and Meharry, with a range of 19.5 to 9.9. The number in column (2a) and the rank in column (2) present the data for the number and not the percentage of the alumni. In general, states with large and rapidly growing populations, particularly where the adjacent states had small and slowly increasing populations, retained relatively high percentages of the graduates of the medical schools located therein; there were, of course, other factors.

In table 21 in Bulletin 101 similar facts regarding the distribution of all the alumni in active private practice are presented for the 71 schools; 51.0% of the alumni in active private practice were residing in the same state as their school, with a range from 91.9 to 9.8% for the individual schools. The ranks, but not the percentages, are presented in column (9b) of table 28 (pages 478 and

479). The five schools with the highest percentages were California, Southern California, Stanford, Southwestern, and Chicago Medical, with a range of 91.9 to 86.1. The middle five schools, ranking 34-38, were Stritch, Hahnemann, Wisconsin, Oregon, and Jefferson, with a range of 54.3 to 48.5%. The five schools with the lowest percentages were Creighton, Hopkins, Georgetown, Howard, and Meharry, with percentages ranging from 20.8 to 9.8.

SMALL TOWN DOCTORS

This era of rapid urbanization has not destroyed interest in the small town doctor. The findings regarding the distribution of the 164,409 alumni according to the population size of city are presented in tables 22, 23, and 23a in Bulletin 101. The first of these three tables presents the tabulation of only the number of alumni of the 71 schools who were residing in each of the 12 classes of cities. (The population size distribution for the 205,000 physicians in the United States in April, 1950, was presented in numbers and percentages in table A in the appendix to Bulletin 94.) Table 23a is based upon 12 population sizes of city, whereas table 23 uses only 4 combinations of these 12; our discussion, based on both tables, will include towns of 100 to 999, 1,000 to 2,499, and 2,500 to 4,999 in table 23a and under 5,000 population in table 23.

Only 5.1% of the alumni of the 71 schools were located in towns between 100 and 1,000 population, with a range of 20.6 to 1.5% for the 71 schools. In this population size classification the five schools with the highest percentage of alumni were Alabama, Medical College of Virginia, Louisville, Vermont, and Tennessee, with percentages ranging from 20.6 to 8.5. The middle six schools, ranking 34-39, were Wayne, Buffalo, Pittsburgh, Chicago Medical, Oklahoma, and Utah, with a range of 4.9 to 4.8%. The five schools with the lowest percentages were Southern California, University of Chicago, Howard, Southwestern, and Meharry, with percentages ranging from 1.9 to 1.5. In general, the picture is not very different for towns of 1,000 to 2,499 population. The five schools with the highest percentages were Tennessee, Louisville, Alabama, Vermont, and Bowman Gray, with percentages ranging from 10.8 to 9.1. The seven middle schools, ranking 33-39, were Illinois, Hahnemann, Temple, Vanderbilt, Colorado, Utah, and George Washington, with a range of 4.5 to 4.4%. The six schools with the lowest percentages were Southern California, New York Medical, New York University, Hopkins, Meharry, and Howard, with percentages ranging from 1.7 to 0.8. In towns of 2,500 to 4,999 there were 4.7% of the alumni of the 71 schools. The six schools with the highest percentages were Georgia, South Carolina, Emory, College of Medical Evangelists, Arkansas, and Tennessee, with percentages ranging from 11.1 to 7.5. The five middle schools, ranking 35-39, were University of Virginia, Wisconsin, Washington, Southwestern, and Marquette, with a range of 4.6 to 4.3%. The six schools with the lowest percentages were Southern California, Stanford, Long Island, George Washington, New York University, and Howard, with a range of 2.4 to 1.8.

Although the intervening population size classifications of cities may be more useful to many, we shall, to conserve space, jump to the classification of cities over 250,000 population, in which 40.4% of the alumni of the 71 schools were residing [column (10d), table 28, and columns (4) and (4a) of table 23 of Bulletin 101].

TABLE 20.—*Number and Percentage of Physicians Residing in the Same State as Their School of Graduation by School*

School	% by Same State of Residence		Number by Same State of Residence	
	Rank (1)	Value (1a)	Rank (2)	Value (2a)
Alabama—California				
Alabama	14	68.5%	65	270
Arkansas	46	42.1	51	629
California	2	86.6	17	1,687
Southern California	1	86.8	45	763
Stanford	3	82.7	30	1,159
Evangelists	18	65.1	26	1,287
Colorado—Georgia				
Colorado	42	45.0	50	642
Yale	58	32.8	57	502
Georgia	23	58.4	42	799
Emory	45	43.1	41	805
Illinois				
University of Chicago	59	32.3	64	271
Northwestern	60	31.5	20	1,529
Illinois	33	51.1	2	2,089
Chicago Medical	4	80.0	68	200
Stritch	30-31	52.3	24	1,330
Indiana—Louisiana				
Indiana	20	62.8	10	1,944
Iowa	44	43.4	32-33	1,116
Kansas	48	39.3	47	718
Louisville	52-54	35.9	31	1,139
Tulane	57	33.3	23	1,350
Louisiana	22	59.5	49	662
Maryland—Massachusetts				
Maryland	51	36.4	27	1,247
Johns Hopkins	67-68	19.5	54	609
Harvard	52-54	35.9	13	1,702
Boston	43	44.6	46	730
Tufts	27	54.8	8	2,634
Michigan—Nebraska				
Michigan	41	45.1	11	1,991
Wayne	5	77.4	16	1,692
Minnesota	29	54.3	7	2,007
Washington	52-54	35.9	34	1,072
St. Louis	64	27.6	38	993
Nebraska	61-62	31.0	48	693
Creighton	67-68	19.5	61	364
New York				
Columbia	25	57.0	6	2,517
Albany	9	73.7	39	959
Buffalo	7	76.9	12	1,807
Long Island	10	72.6	5	2,367
New York Medical	17	66.4	18	1,610
Syracuse	11	71.8	35	1,071
New York University	16	67.3	1	2,930
Cornell	24	57.6	22	1,401
Rochester	40	45.7	59	458
North Carolina—Oregon				
Bowman Gray	39	45.8	70	126
Duke	65	27.3	63	274
Western Reserve	21	61.5	25	1,292
Ohio State	12	70.0	15	1,703
Cincinnati	28	54.5	29	1,177
Oklahoma	30-31	52.3	44	764
Oregon	35-36	47.2	43	774
Pennsylvania				
Pennsylvania	35-36	47.2	4	2,576
Jefferson	37	46.8	3	2,687
Woman's	49	38.3	60	380
Hahnemann	34	49.9	19	1,589
Pittsburgh	8	74.6	14	1,746
Temple	26	56.7	21	1,505
South Carolina—Texas				
South Carolina	19	63.8	40	871
Vanderbilt	63	28.1	55	577
Tennessee	55	35.7	26	1,146
Meharry	71	9.9	69	176
Texas	6	77.2	9	1,956
Baylor	13	69.1	28	1,188
Southwestern	15	67.6	67	238
Utah—Virginia				
Utah	50	36.6	71	91
Vermont	66	24.8	62	341
University of Virginia	56	34.3	52	632
College of Virginia	47	41.7	32-33	1,116
Wisconsin—District of Columbia				
Wisconsin	38	46.0	56	538
Marquette	32	51.2	37	1,026
George Washington	61-62	31.0	53	627
Georgetown	69	18.7	58	459
Howard	70	17.7	66	202
71 Schools		**38.9%**		
Range		**86.8%-9.9%**		**2,930-91**

Source: Table 8 series of publication M-94 of the Bureau of Medical Economic Research.

The five schools with the highest percentages of alumni in these large cities were Chicago Medical, Howard, New York University, California, and University of Chicago, with percentages ranging from 74.0 to 56.8. The five middle schools, ranking 34-38, were Georgetown, Woman's, Temple, Pennsylvania, and Louisiana, with a range of 42.1 to 39.5%. The five schools with the lowest percentages were Albany, Georgia, Vermont, Medical College of Virginia, and South Carolina, with percentages ranging from 18.6 to 10.7.

These data on the distribution of alumni by population size of city are particularly difficult to interpret because of great variations in the prominence of small towns in the population pattern. A digression at this point to create proper frames of reference for judging the percentages for the various schools would carry us far afield.

TABLE 26a.—*Comparison of Data on Number of Diplomates*

American Board of	Year of Activation (1)	Total Certificates Issued to June 30, 1950 No. (2)	Total Certificates Issued to June 30, 1950 % (2a)	Punch-Card Count of Board Members April, 1950 No. (3)	Punch-Card Count of Board Members April, 1950 % (3a)
1. Pediatrics	1933	3,305	8.3%	2,728	9.2%
2. Psych. & Neur.	1934	3,628	9.1	2,837	9.6
3. Ortho. Surg.	1934	1,537	3.9	1,206	4.1
4. Derm. & Syphl.	1932	1,266	3.2	877	3.0
5. Radiology	1934	3,369	8.5	2,533	8.6
6. Urology	1935	1,446	3.6	1,064	3.6
7. OB Gyn.	1930	3,136	7.9	2,395	8.1
8. Internal Med.	1936	6,316	15.9	5,106	17.3
9. Pathology	1936	1,799	4.5	1,383	4.7
10. Ophthal.	1917	3,042	7.6	2,239	7.6
11. Otolaryn.	1924	4,454	11.2	2,968	10.0
12. Surgery	1937	4,317	10.8	3,389	11.5
13. Anes.	1937	683	1.7	436	1.5
14. Plastic Surg.	1937	214	0.5	81	0.3
15. Neurol. Surg.	1940	328	0.8	190	0.6
16. Phys. Med. & Rehab.	1947	140	0.4	100	0.3
17. Preventive Med.	1948	780	2.0	3	*
18. Proctology	1949	44	0.1	1	*
19. Thoracic Surg.	1948	(236)†	(0.6)†	1	*
Total		39,804	100.0%	29,537	100.0%

† Included in figures for American Board of Surgery.
* Less than 0.1%.

Sources: Col. (2), J. A. M. A. **144**:109-184 (Sept. 9) 1950.
Col. (3), Bureau of Medical Economic Research Miscellaneous Publication, M-94.

SIX PART-TIME AND SIX FULL-TIME SPECIALTIES

In the ranks and percentages in tables 24 and 25 of Bulletin 101 and in columns (11a) to (11f) and columns (12a) to (12f) of table 28 (ranks only), the findings regarding the percentages of the alumni who checked a specialty in their self-classification as a part-time specialist (table 24) and as a full-time specialist (table 25) are presented. This shift from the universe of all alumni to the smaller universe of those alumni who classified themselves in each of these two categories should be carefully noted in reading the percentages. The five leading schools whose alumni checked surgery as a part-time specialty were Tennessee, Tulane, Stanford, Texas, and Georgia, with percentages ranging from 55.7 to 52.3. These percentages should be compared with 40.1, the percentage of all part-time specialists of the alumni of the 71 schools who checked surgery. The six middle schools, ranking 32-37, were Illinois, University of Virginia, Buffalo, Marquette, Cornell, and Columbia, with a range of 42.7 to 39.7%. The schools with the lowest percentage of their part-time specialist alumni who checked surgery were Hahnemann, Chicago Medical, Howard, Meharry, and Woman's, with percentages ranging from 24.5 to 1.9. Obstetrics and gynecology was the second most popular part-time specialty, accounting for 10.3% of the alumni of the 71 schools. Of these, the five highest schools were Meharry, Woman's, Southern California, Emory, and Baylor, with percentages ranging from 27.1 to 16.8. The five middle schools, ranking 33-37, were Michigan, St. Louis, Ohio State, Oklahoma, and Howard, all with a value of 10.5%. The four schools with the lowest percentages were Pennsylvania, Syracuse, Buffalo, and Alabama, with percentages ranging from 6.1 to 3.4. Of the remaining four specialties—only six specialties are shown in table 24—checked by part-time specialists, it is noteworthy that the alumni of only four schools checked internal medicine as a part-time specialty.

The same six specialties presented for part-time specialists were presented for full-time specialists. The four most popular specialties checked by full-time specialists were internal medicine; surgery; pediatrics; obstetrics, gynecology (combined); to complete the latter, the separate specialties, obstetrics and gynecology, were added instead of the fifth and sixth most popular full-time specialties, ophthalmology, otology, laryngology, and rhinology (OALR) and ophthalmology (Oph.).

Among the 48,022 full-time specialists of the 71 schools, 16.5% checked surgery. The five highest schools were Harvard, Columbia, Georgia, Vanderbilt, and Hopkins, with percentages (of full-time specialists) ranging from 24.3 to 19.4. The five middle schools, ranking 33-37, were Oklahoma, Illinois, Texas, South Carolina, and Washington, with a range of 15.6 to 15.2%. The five schools with the lowest percentages who checked surgery were Boston, Alabama, Southern California, Southwestern, and Woman's, with a range of 10.7 to 2.8. The five with the highest percentage of full-time specialists who checked internal medicine were Bowman Gray (only four physicians), University of Chicago, Harvard, Hopkins, and Kansas, with percentages ranging from 44.5 to 24.1. The six middle schools, ranking 33-38, were Southern California, Ohio State, Colorado, Maryland, Nebraska, and Buffalo, with a range of 17.9 to 17.0%. The five schools with the lowest percentages were Oklahoma, Vermont, South Carolina, Woman's, and Chicago Medical, with a range of 11.8 to 6.1.

AMERICAN BOARDS

The reader is again referred to the appendix of Bulletin 101 for the shortcomings and limitations of the data. This applies particularly to the section on American Boards because of a known factor in the study that results in an understatement of the number of diplomates of American Boards who were alumni of the 71 schools living in the United States as of April, 1950. This section of the report is based upon table 6a and the 71 individual school tables in series 6 of M-94. Of the 164,409 alumni of the 71 schools, 25,400 (or 15.4%) were American Board members. In addition, 2,177 graduates (8.0%) of other U. S. medical schools, 775 alumni (18.8%) of Canadian schools, and 1,185 alumni (12.6%) of foreign schools were diplomates as of April, 1950. Our punch-card file of 29,537 may be

TABLE 26.—*Distribution by School and Five-Year Graduation Groups Showing Percentages and Rank in Array for American Boards*

School	Total		1945-1949		1940-1944		1935-1939		1930-1934		1925-1929		1920-1924	
	Rank (13a)	Value (13)	Rank (12a)	Value (12)	Rank (11a)	Value (11)	Rank (10a)	Value (10)	Rank (9a)	Value (9)	Rank (8a)	Value (8)	Rank (7a)	Value (7)
Alabama—California														
Alabama	64-65	5.8%	..	....	..	....	..	....	..	....	..	....	..	....
Arkansas	61	6.8	..	....	64	1.3%	56	13.5%	57	12.6%	46	15.4%	49	14.8%
California	14	18.8	..	....	3	10.5	11	35.3	21-22	27.6	15	29.0	11	31.4
Southern California	44-46	10.9	3-8	0.3%	5	9.0	19	30.2	27-28	25.0	..	....	..	....
Stanford	9	21.2	..	....	1	14.5	8	37.7	13	35.9	10	32.0	31-33	19.8
Evangelists	57	8.9	..	....	52	3.2	57	12.8	54	13.7	58	10.9	53	13.1
Colorado—Georgia														
Colorado	20	16.7	..	....	37-38	4.0	23	27.8	24	26.7	7	34.2	17	26.1
Yale	4	25.7	..	....	14	7.0	4	44.5	3	48.1	4	41.9	5	36.4
Georgia	60	6.9	..	....	65-66	0.8	55	13.9	58	12.3	42	17.2	42	17.1
Emory	33-34	13.5	..	....	39-41	3.9	25	26.9	37	20.2	23	23.9	28	21.0
Illinois														
University of Chicago	23	15.9	2	0.4	16	6.7	5	42.5	10	36.9	..	....	..	....
Northwestern	16-17	17.8	3-8	0.3	2	12.2	13	33.6	21-22	27.6	24-25	23.3	26	22.2
Illinois	39	12.7	..	....	18	6.5	30	24.7	26	25.8	39-40	18.3	20-21	23.7
Chicago Medical	66	4.0	..	....	..	....	..	....	..	....	62	2.2	60	2.6
Stritch	58	7.4	..	....	27-28	4.9	61-62	10.1	64	10.1	57	11.7	58	9.3
Indiana—Louisiana														
Indiana	35	13.1	..	....	54-55	2.7	37	22.0	36	21.3	36	19.0	29	20.7
Iowa	18	17.7	..	....	39-41	3.9	20	29.0	29	24.8	16-17	28.7	14	28.6
Kansas	36-37	13.0	..	....	36	4.1	43	20.1	34	22.7	21	26.0	44	16.1
Louisville	53	9.1	9-11	0.2	34	4.3	45	19.0	56	12.8	39-40	18.3	41	17.5
Tulane	29	14.2	..	....	46-48	3.5	32	24.2	32	24.3	33-34	19.8	31-33	19.8
Louisiana	64-65	5.8	..	....	46-48	3.5	44	19.7	59-60	12.0	..	....	..	....
Maryland—Massachusetts														
Maryland	40	12.5	..	....	37-38	4.0	31	24.4	40	19.1	37	18.6	45	16.0
Johns Hopkins	1	37.1	3-8	0.3	4	9.2	1	55.7	2	55.6	1	51.7	1	51.7
Harvard	2	32.7	..	....	19-20	6.2	2	49.5	1	58.5	2	47.7	2	48.9
Boston	41	12.2	..	....	24-25	5.2	27	25.4	52	14.2	43	16.9	18	26.0
Tufts	33-34	13.5	..	....	43-45	3.7	38	21.9	43-45	17.9	35	19.7	40	17.7
Michigan—Nebraska														
Michigan	7	23.1	..	....	8	8.0	15-16	33.1	11	36.5	8	33.0	10	31.8
Wayne	44-46	10.9	..	....	22-23	5.4	48-49	17.0	43-45	17.9	47	14.5	48	14.7
Minnesota	16-17	17.8	..	....	12-13	7.2	22	28.6	31	24.4	20	26.8	22	23.5
Washington	10	21.0	..	....	10	7.7	17	32.8	14	34.5	14	29.6	12	30.6
St. Louis	48	10.6	..	....	54-55	2.7	54	15.2	53	14.1	50	14.1	37	18.3
Nebraska	27	14.6	..	....	42	3.8	29	25.2	25	26.1	38	18.4	31-33	19.8
Creighton	55-56	8.5	..	....	49-51	3.4	61-62	10.1	61	11.7	48	14.4	46	15.0
New York														
Columbia	3	27.2	..	....	24-25	5.2	6	41.9	4	43.7	3	44.2	4	40.8
Albany	42-43	11.5	..	....	32	4.5	41-42	20.2	46	17.2	30	21.5	36	18.8
Buffalo	28	14.3	..	....	46-48	3.5	35-36	23.2	33	23.3	29	22.1	23	23.4
Long Island	15	17.9	..	....	43-45	3.7	28	25.3	23	27.4	13	30.1	20-21	23.7
New York Medical	49	10.1	..	....	22-23	5.4	53	15.3	42	18.0	51	13.5	57	10.0
Syracuse	12-13	19.1	..	....	21	5.5	39	21.2	20	28.8	19	27.8	7	35.1
New York University	8	22.0	..	....	15	6.8	9-10	35.8	15	33.7	12	30.3	9	33.3
Cornell	5-6	25.2	3-8	0.3	6	8.3	3	44.6	5	42.0	5	39.1	8	33.8
Rochester	24-25	15.6	..	....	17	6.6	9-10	35.8	9	38.0	18	28.6	..	....
North Carolina—Oregon														
Bowman Gray	69	0.4	..	....	63	1.5	..	....	..	....	..	....	..	....
Duke	30	14.1	..	....	26	5.1	7	38.0	8	38.6	..	....	..	....
Western Reserve	12-13	19.1	..	....	19-20	6.2	18	32.7	16	31.6	11	31.8	16	26.8
Ohio State	44-46	10.9	..	....	30-31	4.7	46	17.8	47	17.0	44-45	15.7	55	10.8
Cincinnati	21	16.4	..	....	7	8.2	21	28.9	19	28.9	28	22.5	27	21.3
Oklahoma	55-56	8.5	..	....	61-62	1.6	50	16.2	51	14.8	56	12.3	56	10.4
Oregon	31-32	13.7	..	....	57	2.4	24	27.7	27-28	25.0	31	21.3	25	22.6
Pennsylvania														
Pennsylvania	5-6	25.2	9-11	0.2	9	7.8	15-16	33.1	6	39.8	6	37.4	6	36.0
Jefferson	24-25	15.6	..	....	49-51	3.4	41-42	20.2	18	29.1	26	23.1	34	19.2
Woman's	54	9.0	..	....	11	7.4	51-52	16.1	49-50	16.3	55	12.8	47	14.8
Hahnemann	63	6.3	..	....	60	1.7	65	7.2	63	10.2	52-54	13.1	50	13.9
Pittsburgh	31-32	13.7	..	....	56	2.5	33	24.1	35	22.6	24-25	23.3	15	28.1
Temple	52	9.2	..	....	49-51	3.4	48-49	17.0	49-50	16.3	44-45	15.7	54	11.5
South Carolina—Texas														
South Carolina	50	9.7	..	....	35	4.2	51-52	16.1	48	16.7	49	14.3	39	17.8
Vanderbilt	19	16.9	..	....	12-13	7.2	26	26.1	7	39.1	27	22.7	30	20.6
Tennessee	62	6.5	..	....	61-62	1.6	63	9.3	55	13.1	59	10.8	52	13.4
Meharry	68	1.1	..	....	67	0.7	66	4.3	66	2.6	63	1.9	..	....
Texas	26	14.7	1	0.5	27-28	4.9	34	23.5	30	24.6	16-17	28.7	43	16.5
Baylor	42-43	11.5	..	....	39-41	3.9	47	17.1	39	19.4	41	17.6	51	13.7
Southwestern	70	0.3	..	....	65-66	0.8	..	....	..	....	..	....	..	....
Utah—Virginia														
Utah	..	....	..	....	..	....	..	....	..	....	..	....	..	....
Vermont	38	12.8	..	....	43-45	3.7	35-36	23.2	41	18.8	33-34	19.8	35	19.0
University of Virginia	11	20.9	3-8	0.3	29	4.8	14	33.2	12	36.4	9	32.5	3	44.1
College of Virginia	47	10.8	9-11	0.2	53	3.0	58	12.6	43-45	17.9	52-54	13.1	38	18.0
Wisconsin—District of Columbia														
Wisconsin	22	16.2	3-8	0.3	30-31	4.7	12	34.1	17	30.8	22	25.9	..	....
Marquette	59	7.0	..	....	33	4.4	60	12.2	59-60	12.0	60	6.6	24	23.0
George Washington	36-37	13.0	..	....	58-59	2.1	40	20.3	38	19.7	32	20.9	13	29.5
Georgetown	51	9.3	..	....	58-59	2.1	59	12.3	62	11.6	52-54	13.1	19	24.0
Howard	67	2.9	..	....	68	0.5	64	8.0	65	4.8	61	3.2	59	4.4
71 Schools	15.4%		0.1%		5.0%		24.8%		24.9%		24.0%		25.0%	
Range	37.1%-0.0%		0.5%-0.0%		14.5%-0.0%		55.7%-0.0%		58.5%-0.0%		51.7%-0.0%		51.7%-0.0%	

Source: Table 6 series of publication M-94 of the Bureau of Medical Economic Research.
The column numbering of Table 6 series is retained in Table 26.

contrasted with the total of 39,804, the number of certificates awarded by 18 specialty boards prior to June 30, 1950.[2] The excess of some 10,000 in total certificates issued is accounted for by the following facts: 1. Some certificate holders had died and some were not residing in the United States. 2. We punched into our cards only the code numbers of the first board certificate received by a physician, not subsequent certificates; some of the diplomates of the more recently organized boards, already recorded as diplomates of older boards, were not recorded as members of the younger boards. 3. There is a definite time lag, probably random in character, in the receipt of information by our I. B. M. section from the Directory Department in the matter of certification. Unlike the information on self-declared specialists, information on diplomates is received by the Directory Department in the form of a list from each board. Percentage comparison of our 29,537 with the 39,804 certificates issued is rather reassuring (table 26a). On both bases, American Board 8, internal medicine, accounted for the highest percentages of the total diplomates, 15.9 and 17.3. American Board 11, otolaryngology, and American Board 12, surgery, ranked second and third in the number of certificates ever issued but third and second in our punch card data. American Board 2, psychiatry and neurology, and American Board 5, radiology, ranked fourth and fifth in both distributions. This comparison suggests that our punch-card data on diplomates may, except for the newest boards, be reasonably satisfactory for the purpose of comparing the percentage of the alumni of one medical school with the percentage of the alumni of another medical school, although our number of diplomates may be too few for both schools.

The percentage of all the alumni of each school who were certified by an American Board in April, 1950, is shown in column (13) and the rank in column (13a) of table 26; the rank only is shown in column (13) of table 28. The six schools with the highest percentage of alumni who were diplomates of American Boards were Hopkins, Harvard, Columbia, Yale, Cornell, and Pennsylvania, with percentages ranging from 37.1 to 25.2. These percentages are considerably above the 15.4 for the entire group of 164,409 alumni. The six middle schools, ranking 33-38, were Emory, Tufts, Indiana, Kansas, George Washington, and Vermont, with a range of 13.5 to 12.8%. The five schools with the lowest percentage of alumni certified by the American Boards were Chicago Medical, Howard, Meharry, Bowman Gray, and Southwestern, with percentages ranging from 4.0 to 0.3. It is worth noting that only 0.1% of the 27,198 graduates of the 71 schools in the 1945-1949 graduation classes had been certified by April, 1950; moreover, only 5.0% of the graduates of 1940-1944 had been certified. The percentage and the rank for five-year graduation groups during the period 1920-1949 are presented in table 26; the ranks for a selected five-year graduation period, such as 1935-1939, may actually be more meaningful than the ranks based upon the percentage of all certified alumni. This age factor makes it difficult to interpret the full significance of these sharp differences in the percentages based on all alumni.

2. Approved Examining Boards in Medical Specialties, J. A. M. A. **144**: 149 (Sept. 9) 1950.

INDIVIDUAL BOARDS

Table 27 in Bulletin 101 supports table 26 in providing the rank and the percentage of all diplomates—a smaller universe—in each of 10 boards and in the nine other boards combined. The data for those boards with fewer than 1,000 diplomates—American Boards 4, 6, 13, 14, 15, 16, 17, 18, and 19—were grouped together under the heading "Other Boards" simply because the number of members of each of these boards was too small to distribute among 71 schools.

In columns (1a) to (11a) the total number of diplomates—not the total number of alumni—of the school was set equal to 100.0%. The five schools having the highest percentage of all their diplomates who were certified by American Board 8, internal medicine, were Harvard, University of Chicago, New York University, Cornell, and Rochester, with almost one-fourth of all their diplomates in internal medicine. Hopkins (which had the highest percentage of its alumni certified by some board) ranked only sixth in the proportion of all of its diplomates certified by American Board 8. The five middle schools, ranking 32-36, were Syracuse, Jefferson, Creighton, Louisiana, and New York Medical, with a range of 16.1 to 15.4%. The six schools with the lowest percentages of their diplomates in internal medicine were Vermont, Oklahoma, Hahnemann, Arkansas, Stritch, and Woman's, with percentages ranging from 9.7 to 4.5. Harvard also ranked first in the percentage of all its diplomates in the American Board of Surgery, but the University of Chicago ranked only 35th; Meharry was second, Hopkins third, University of Virginia fourth, and Columbia fifth, with percentages ranging from 23.6 to 16.5. Harvard had 48.8% of all its diplomates in internal medicine and surgery, and Hopkins had only 42.2%, indicating that Hopkins alumni concentrated a little less on these two specialties than Harvard alumni.

To some medical educators the rank and percentage of all diplomates for the other boards may be more significant than those for the two boards discussed—surgery and internal medicine. The ranks for each of the ten larger boards only are presented in columns (13a) to (13j) of table 28 and for the eight smaller boards combined in column (13k). Finally, the emphasis on the alumni of each medical school is shifted in columns (12), (12a), and (12b) of table 27 to all the certified diplomates of the 71 schools treated as a group. The number, percentage, and rank of each school are presented; that is, the total number of certified diplomates of each school is given in column (12b), the percentage of all the certified diplomates of the 71 schools in column (12a), and the rank of the percentages in column (12). Harvard had the most diplomates, 1,629 or 6.4% of the 25,400, followed by Pennsylvania, Columbia, Hopkins, Michigan, and New York University.

COMMENT

I offer no conclusions because it has been my purpose to present a summary of the data presented in the 620 tables in this study rather than any interpretations of them. The comments of medical educators on this study may enable us to offer some interpretations of the data in subsequent studies of the distribution of medical school alumni.

PUBLIC RELATIONS

SNOWBALLING SOCIAL SECURITY

I would like to examine this snowball not so much from the standpoint of present social security legislation but from what lies behind it, what is happening, and what the future holds. It is my opinion that the American people are becoming more afraid of and are running away from their own Revolution. Contrary to what most people think, the American Revolution was essentially a revolutionary idea; it was a reversal of the Old World form of a sovereign state and subject people to a new form—a sovereign people and a servant state.

NEW CONCEPT OF GOVERNMENT

The people who settled here and set up our political institutions held the radical idea that they had certain inalienable rights as the gift of God and that it was the function of government only to secure them in these rights. They believed that so strongly that they limited their government to such an extent that two very remarkable things happened. First, no citizen in this country in its early days would turn to government for succor any more than he would turn to a beggar for it because the government had nothing to give nor did it have the power to take from others that it might give. As a result, we became responsible for ourselves, and we developed the greatest self-reliance ever known in all history. Second, the people were not as inhibited in their creative actions as they had been in the Old World, and we noted a remarkable release of human energy. These two things, then, constitute the miracle referred to as America.

I have said that we are running away from our own Revolution, and by that I mean that we are running toward the very thing from which we originally ran.

This authoritarianism toward which we are now running often is referred to as socialism, state or government ownership, or control of the means of production. Communism is another one of these so-called progressive ideologies.

We had a fine example of that in the days of the Pilgrims. It made no difference how much or how little the members of that colony produced as the produce went into a common warehouse under authority and the proceeds of that warehouse were doled out in accordance with the authorities' idea of the need. In other words, they originally practiced the theories Karl Marx held up two centuries later as the ideal of the Communist party—from each according to his ability to each according to his need by authority of the state.

ADOPT NEW PRINCIPLE

The Pilgrims quit this because the warehouse ran out of provisions, and Governor Bradford said to the remaining members of the Colony, "Come next spring we are going to get rid of this system. We are going to adopt the principle: To each according to his merit instead of to each according to his need." This philosophy of "from each according to his ability to each according to his need" is exactly what we now are running toward. We can also think of this as the exact opposite of the Judeo-Christian philosophy of charity, which is a voluntary, spontaneous act as distinguished from trying to do good for others by the use of collective power. Countless examples of what I am talking about may be found in the federal budget as well as the budgets of the 120,000 other governments in this country. One example would be the Marshall Plan; another, Point Four. It would include all subsidies; minimum wage laws; every federal subvention to every state, community, and district; protective tariffs; public housing; the TVA; the progressive income tax; and compulsory social security and all compulsory health and medical plans.

As a matter of fact, this philosophy is a sort of black magic where the witch doctor tries to do good for somebody by expropriating from the people he is trying to do good to.

The various name tags, such as communism, fascism, Nazism, Fabianism, the welfare state, the planned economy, new, fair and other kinds of deals, are not very definitive. They are mere emotional responses to something we do not like. What is this thing that is bothering us, that is bothering you folks as doctors? It is not peculiar to you at all. You are just a part of the whole. If someone came to you, as a doctor, with manifestations of a skin disease, you would not try to get rid of each sore by the application of a salve but would take a look at the person systematically. So let us take a systematic look.

GROWTH OF CONTROL

We see a rapidly growing belief in the use of organized police force—which is government—as a means to direct and control and own the creative activities of citizens within a society. I am old enough to remember when, if we wanted housing, we relied on private enterprise for it. In spite of the fact that under that system we built in this country more square feet of housing per person than ever existed in any country in the world, more and more persons are believing today that the only way you can have adequate housing is to use the collective power of government and forcibly take the wherewithal from you and you and you and let the authorities determine the need. This application of the Marxian ideal is not peculiar to the housing situation. There is not a segment of the American economy to which it does not apply. The fact that this theory is being applied to doctors and that you are concerned about it is interesting. It affects you a little more directly than in some other cases where it may apply only to a person's income. It affects you more directly because you render service that is very personal. It has to do not so much with money, although it applies to that too, but with where and how and under what

Address delivered at the Eighth National Medical Public Relations Conference by Leonard E. Read, President, Foundation for Economic Education, at Boston, Nov. 28, 1955.

conditions you work. That is the reason doctors are a little more cognizant of what is going on than people in other walks of life.

NEED MORE FAITH IN FREE MEN

I have said that this belief in the the use of force as a means of getting things done is increasing. But as this belief increases there is also a corresponding diminishing faith in free men to get things done. If that reasoning be sound, and I think it is, then it follows that the solution of this problem has to take a positive form, namely, a restoration of faith in free men. But that is a lot easier to admonish than it is to accomplish. If I should ask any group of persons if they were in favor of the government delivering the mail I am almost certain they would say "of course." The reason they would say that is because the government has had a monopoly of that activity for so many years that all entrepreneurs have given up any idea as to how it could be done as a private venture.

A little private research on my part the other day revealed that more pounds of milk are delivered per day than mail. I also discovered that milk is more perishable than a letter and milk is delivered more efficiently and more promptly than our mail. So, I got to wondering why we do not deliver mail through private enterprise. I think we are victims of a myth. Another way you can measure how this thing is gaining ground is to take a look at the loss of freedom of choice that the average American citizen has with his income dollar. There was a time less than a century ago when the average citizen had a freedom of choice with about 95% of his income dollar. That was because the government's take was 5% of the earned income. This percentage of take of earned income has gone up until today it stands at 36%. Expressed still another way, less than a century ago the average citizen had to work for the government about a dozen days a year. Now he has to work for the government about 130 days, and, if he is really successful, 317 of the 365 days of the year.

INFLATIONARY MEASURES SPREADING

A lot of people say, "Well, we still have 64% freedom of choice with our income dollar, and that is good enough." But the persons who say that overlook a very interesting fact. It has been discovered by careful research that when any government takes between 20 and 25% of the earned income of the people, the people themselves will demand artificial increases in the volume of the money. In other words, they demand inflationary processes as a means of escaping the direct payment of taxes. Since we have increased our programs of deficit financing and monetization of debt, we have increased our money supply by seven times.

France, for example, began this program of the state assuming the responsibility for the welfare of the people in 1915. In the 40 years since that time, the franc has lost more than 99.5% of its purchasing value. Visualize if you will a young Frenchman in 1915 who wanted to take care of himself in his old age. He purchased a paid-up annuity that would pay him a thousand francs per month beginning in January, 1955. A thousand francs per month in 1915 would have permitted him to live like a prince. But a man cannot live only on one meal per month, which is about all a thousand francs will buy today.

If you want to test the validity of this line of reasoning historically, look at what has happened in such countries as Germany, Russia, France, and England. Only 26 years ago, the take of earned income by the government in Russia was 29%, in Germany 22%, and in France and England 21%. When you realize that the percentage in this country is now 36% and the belief in the use of organized police force is continuing to grow, you can see the problems.

A study just completed by the Opinion Research Corporation covering the period from 1953 to 1955, entitled "Free Market Versus Socialistic Thinking," emphasizes this only too well. Here is an example of the type of questions asked of people across the nation: "Should the government try to help prosperity by spending programs?" In 1953, 19% of the farmers said yes; in 1955, 36% said yes. Answers given by the businessmen shocked me the most. In 1953, 19% of them said yes, and today 35% said yes. This leads to the assumption that only now and then can you find a businessman who is interested in private enterprise. What can you do about this problem? You know, a lot of people think that they are adequate fighters simply because they themselves are opposed to it. There never was a greater fallacy. Certainly being opposed to something does not qualify you as an effective fighter against socialism or communism or this growth of collective power as a means of getting things done.

CALL FOR LEADERSHIP

There are two points I wish to make with regard to what should be done. First of all, the medical profession must realize that what is happening to doctors is nothing but a manifestation of a thing that is more fundamental. If you are going to use a good technique, you will fight this use of police force as a means of owning, controlling, and directing creative activities in whatever area you see it arising. In other words, the best way to stave off disease is to stop it. If the disease of excessive government control exists, you cannot stop it from socializing medicine. As it gets worse, your problem will get worse and all the little battles you wage will not make any difference. You can fight it much better in the housing or electrical fields than you can fight it as it applies to yourself.

Second, regarding methods, I think that one of the main reasons why this philosophy of socialism is gaining so rapidly is because there is nothing substantial standing against it. Today you can hardly find a person who will qualify as a skilled, accomplished expositor of the free market, private property, or limited government philosophy. In other words, it is the lack of persons qualified to explain our own philosophy that is the cause

of our difficulty. If this be right, then the solution to this problem has to be the development of a corps of persons who are skilled, accomplished expositors of this philosophy.

LEARN THE ANSWERS

How do you go about this task? A lot of people seem to think that the selling-the-masses approach is the way to do it. The assumption is that I have all the answers and if everybody only knew what I know, *ipso facto*, the millenium. But there is something wrong with that technique. The way to do this is to become a skilled expositor of this philosophy of free enterprise yourself, because you cannot possibly have an upgrading influence upon others unless you yourself are ahead of them in understanding. In connection with this problem of learning our own philosophy, one must first have the desire to learn, and, second, one must find a source of learning. Certainly we need to find literally hundreds of thousands of persons in this country who have the desire to learn this free market philosophy, because, if they do not have this desire, all the talking and pamphleteering we may do will make no difference.

How do you create this widespread desire to learn? The second part of the equation, the source of learning, is the way you do it. To illustrate this point, remember that only 15 years ago there wasn't a widespread desire to learn about nuclear fission. But the moment one person learned how to release atomic energy, there was automatically created a desire to learn about it on the part of persons all over the world who had an aptitude for that subject. As you can see, it was the source of the understanding that created the desire to learn. Developing the source of knowledge and selling the masses are two vastly different techniques. To illustrate, I will tell a story. I belong to a golf club made up of 250 dubs, among whom I am a distinguished incompetent. For the sake of argument, let us assume that my objective is to get all of the members of my club to become scratch golfers. So I use this selling-the-masses technique and admonish my colleagues to become scratch golfers. I submit that this type of action on my part would be repelling, and, if I persisted long enough, I would be asked to resign.

BEGINNING WITH OURSELVES

But if I go about it the other way, if I work on the one person over whom I have control in the creative sense and try desperately to become a scratch golfer myself and succeed, that kind of improvement on my part would be attractive and most of those dubs would come to me and say, "If you can do it, I can do it. Won't you teach me?" By my understanding, I will qualify as a teacher, and that is all we need with this business: "Start with yourself."

In conclusion, I would like to tell you another story as to how this method works. A year ago a staff member of *Reader's Digest* told me that the magazine wanted to reprint the article, "If Men Were Free to Try," by John Sparks. He said they would send a $200 check to Mr. Sparks and another $200 check to the Foundation for Economic Education. Naturally, we were very pleased because we tell people to reprint our material even without asking permission because we are interested in the dissemination of the ideas. Later, while chatting with Mr. DeWitt Wallace, editor of the *Reader's Digest*, he told me they were delighted with the article and handed me two checks—one to Mr. Sparks for $500 and another to the foundation for $2,000. I thought this would be a good time to make my point, so I said to Mr. Wallace, "Maybe you would be interested in learning how this piece you admire came into being." Then I told him how I had spoken in 1946 at an annual banquet of home builders in Canton, Ohio. After my speech two young architects, Bill Dykes and Dick Lawrence, asked to discuss the matter at more length with me.

The burden of their argument was this: They agreed with my philosophy but wondered how they could organize to get action and put these ideas into people's heads. I told them they should try to forget about everybody else and concentrate on becoming skilled, accomplished expositors of this philosophy themselves. Furthermore, I told them that if they succeeded I would make them two promises. First, that then and only then would they become influential in stopping socialism, and, second, that this accomplishment of theirs would attract others who would want to learn by reason of what they knew. I told Mr. Wallace that these two took my advice and that he would have a difficult time finding any other two men more skilled in this philosophy than Bill and Dick.

The second part of the promise came true. By reason of what they had learned, there are now 100 men and women in all walks of life in Canton, Ohio, meeting to discuss this philosophy to learn how to explain it better. The first person who was attracted to Bill and Dick was the author of this article, John Sparks. In the past eight years Mr. Sparks has progressed so far and can write an explanation of our philosophy so well that you, Mr. Wallace, now offer me $2,500 and insist upon giving the piece he wrote a duplication of over 15 million.

WORK FOR LIBERTY

Arrangements such as this today, where a person like myself talks to professional people like you, are often criticized on the grounds that "we are only talking to ourselves." But ask yourselves, how many of us in this room really understand liberty? I doubt that this question can be answered affirmatively, but I believe there is an infallible way to answer it negatively. There isn't anyone in this room who understands liberty who is not in one way or another working in liberty's behalf. It is utterly impossible for one who understands liberty to remain inactive while liberties are being lost. If I had an average person in a swimming pool and was strong enough to hold his head under water, he would struggle to get out from under my hand because he would know that if he did not he would die. People who understand liberty know that if they don't have it they perish. Anyone who understands liberty cannot help but work in liberty's behalf.

MEDICAL NEWS

CALIFORNIA

Society News.—Officers of the San Jose Surgical Society include: Dr. Eugene R. Perez, president; Dr. Glen S. Harman, president-elect; Dr. Ralph S. Purdy, secretary; and Dr. J. Frederic Snyder, treasurer.——The Metropolitan Dermatological Society of Los Angeles recently elected Dr. Harold Price, North Hollywood, president; Dr. Edward L. Murphy, Burbank, vice-president; and Dr. Laurence J. Underwood, Glendale, secretary-treasurer.

Annual Surgical Lectures.—The annual surgical lectures, offered by the University of California School of Medicine and University Extension Feb. 13-14 and consecutive Wednesdays, Feb. 29-May 2, from 8 to 10 p. m., will deal with recent advances in general surgery. Fee for the course is $50. Lecturers from outside the Los Angeles area will include: Drs. H. Glenn Bell, San Francisco; Charles G. Child III, Boston; Michael E. DeBakey, Houston, Texas; Henry N. Harkins, Seattle; Victor Richards, San Francisco; and John M. Waugh, Rochester, Minn. Requests for applications should be made to Dr. Thomas H. Sternberg, University of California Medical Center, Los Angeles 24 (GRanite 8-9711, Ext. 202).

Course on Sterility.—The University of California Extension will offer a course on sterility to graduates of approved medical schools with consent of the course chairman on Thursdays, Feb. 23-March 22, in room 2142 of the Life Science Building at the University of California at Los Angeles and to graduates of approved medical schools with consent of the planning committee on Wednesdays, 7-10 p. m., Feb. 22-March 21, in the Nurses' Auditorium, San Diego County General Hospital (at the north end of Front Street in San Diego). Information can be obtained from Dr. Thomas H. Sternberg, Assistant Dean for Postgraduate Medical Education, University of California Medical Center, Los Angeles 24. The course is designed to provide a clinical survey of the problem of infertility. Details of diagnosis and therapy will be presented.

COLORADO

Postgraduate Course in Otolaryngology.—A postgraduate course, "Ear, Nose and Throat Problems in General Practice," will be given at the University of Colorado Medical Center, Denver, March 15-17, with the cosponsorship of the Colorado Otolaryngological Society. The guest lecturer will be Dr. Francis L. Lederer, head, department of otolaryngology, University of Illinois College of Medicine, Chicago. The course is open to all graduates of accredited medical schools and/or members of their respective medical societies. The registration fee will be $5 and tuition, $25. Interns, residents, and members of the faculty of the University of Colorado School of Medicine are invited to attend without charge. For application write to the Director of Postgraduate Medical Education, University of Colorado Medical Center, 4200 E. Ninth Ave., Denver 20.

CONNECTICUT

Arthritis Study Unit.—"Clinical Applications of Bone Physiology" will be delivered by Dr. Charles O. Bechtol, associate professor of orthopedic surgery, Yale University School of Medicine, in the Fitkin Amphitheater, Yale-New Haven Medical Center, Feb. 16, 3:30 p. m., under the auspices of the arthritis study unit of the medical school.

Society News.—The Yale Medical Society will present "The Process of Aging as Reflected in the Human Gonad" by Earl T. Engle, Ph.D., professor of anatomy, Columbia University College of Physicians and Surgeons, New York, in Fitkin Amphitheater, Yale-New Haven Medical Center, Feb. 13, 8:15 p. m. Physicians on call should leave the number LOcust 2-1161, Ext. 865.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

DISTRICT OF COLUMBIA

Seminar on the Thyroid Gland.—At the fifth midwinter seminar of the Medical Society of the District of Columbia, "Diseases of the Thyroid Gland" will be presented Feb. 14-16 in the Medical Society Building, 1718 M St. N. W. Guest speakers will include Drs. George Crile Jr., Cleveland; Edgar L. Frazell, New York; and John C. McClintock, Albany, N. Y., who, with Dr. Calvin T. Klopp, Washington, D. C., will participate in a panel discussion on the diagnosis and treatment of nodular goiter and thyroid cancer Thursday, 8 p. m. Dr. McClintock will also discuss "Thyroid Disease in Pediatrics" Wednesday evening.

IDAHO

Physicians for U. S. Senator.—Dr. Raymond L. White, physician and surgeon from Boise, Idaho, has announced his candidacy for the U. S. Senate in the Aug. 14 Republican primary. The medical profession has not been represented in the U. S. Senate since the death of Dr. Royal S. Copeland, a Democrat, on June 17, 1938. Dr. White is serving his second term as Ada County state senator. He has served on numerous state legislative committees and in 1953 obtained approval of a measure establishing a 15-member legislative interim committee to study medical care programs in his state. He has been an alternate delegate of the Idaho State Medical Association to the House of Delegates of the American Medical Association for several years. Another physician who has announced his intention to seek the Republican nomination for the U. S. Senate seat now held by Republican Herman Welker is H. Ray Hatch of Idaho Falls. Dr. Hatch is the founder of the Hatch Clinic. Walter H. Judd, M.D., Minnesota Congressman, who is serving in the present session of the 84th Congress, once said that "what we need most in Washington is more doctors in government and, above all, more of the kind of mental habits that good doctors must have." And in 1951 he said: "Whether we will long have the chance to use with success and satisfaction the scientific knowledge and skills we have worked so long to acquire will be determined by how well we handle our political affairs."

ILLINOIS

Seminar in Psychiatry.—In its series of seminars on "Modern Concepts in Psychiatry," the Veterans Administration Hospital, Downey, will present "Evolution in Psychotherapy of Various Psychopathological States" Feb. 28. A case presentation will be made at 10 a. m. At 1 p. m. the speaker will be Dr. Lawrence C. Kolb, professor of psychiatry, Columbia University College of Physicians and Surgeons, New York.

Chicago

Fellowship and Residency in Allergy.—A fellowship in allergy available at Northwestern University Medical School provides a combination of clinical and investigative work in allergy for training in specialization and is approved for credit by the Board of Internal Medicine and the Subspecialty Board of Allergy. The annual stipend is $3,000. A residency in allergy available at the Veterans Research Hospital provides for service equally divided at the hospital and the medical school. For details write to Dr. Samuel M. Feinberg, Northwestern University Medical School, 303 E. Chicago Ave., Chicago 11.

Hospital News.—The following physicians, who have served Michael Reese Hospital for at least 30 years, recently were awarded bronze plaques: Robert A. Arens, Ralph B. Bettman, Leon Bloch, William A. Brams, Joseph K. Calvin, Joseph S. Eisenstaedt, Jesse R. Gerstley, Irvin S. Koll, Eugene P. Lieberthal, Morris L. Parker, Samuel J. Pearlman, Ralph A. Reis,

Harry C. Rolnick, Philip Rosenblum, William H. Rubovits, Samuel Salinger, David L. Schram, William A. Smiley, Irving F. Stein Sr., Alfred A. Strauss, Sidney Strauss, and Erwin P. Zeisler. Posthumous awards were made to Drs. Isaac A. Abt, Julius H. Hess, and Jacob Meyer.

Dr. Daro Honored.—Dr. August F. Daro, chief of the obstetrical and gynecological departments at Columbus Hospital, was recently honored at the 50th anniversary celebration of the founding of the hospital. At a dinner attended by Samuel Cardinal Stritch and 800 other clerical, medical, and civic leaders, the Gold Star of Solidarity was presented to Dr. Daro by the Italian government. Dr. Daro, who has served as member of the Cook County staff for nearly 25 years, is head of the women's departments of the Mother Cabrini Memorial, Frank Cuneo Memorial, and Norwegian American hospitals. He served with the Medical Corps of the U. S. Army from July, 1942, to December, 1945, attaining the rank of lieutenant colonel.

INDIANA

Postgraduate Programs.—The Indiana University School of Medicine, Bloomington-Indianapolis, announces a series of postgraduate programs, approved for credit by the American Academy of General Practice under category 1. Following is the program for February:

Feb. 15, Heart Symposium: Rheumatic fever and cardiac complications; coronary heart disease; hypertension.
Feb. 26-28, Electrocardiography: Basic concepts incorporating the newer leads and their interpretations. (Limited to 30.)
Feb. 29, Clinical Uses of Radioisotopes: Lectures; laboratory demonstrations and exercises; clinical methodology and evaluations. (Meets Wednesdays for 10 weeks.)

IOWA

Course for Practitioners.—The Iowa Academy of General Practice offers a refresher course Feb. 15-18, arranged by Dr. William C. Keettel, director of postgraduate medical studies for the State University of Iowa College of Medicine, Iowa City. The course is open to all physicians in Iowa. The registration fees are $10 for the entire course or $5 per day for academy members ($35 and $10, respectively, for other doctors). Presentations by out-of-state speakers include:

Significance of Pelvic Pain. Pitfalls in the Diagnosis of Ectopic Pregnancy, William F. Mengert, professor and head, department of obstetrics and gynecology, University of Illinois College of Medicine, Chicago.
Common Problems of the Newborn. Respiratory Problems of the Newborn, Herbert C. Miller, chairman, department of pediatrics, University of Kansas School of Medicine, Kansas City.
Use and Abuse of Adrenal Steroids, Edgar S. Gordon, professor of medicine, University of Wisconsin Medical School, Madison.

Personal.—Dr. Elwood P. Russell, Burlington, has been honored by his home town, Oakville, which recently changed the name of its principal street from Main Street to Russell Street.—— The Fayette County Medical Society recently gave a dinner at the Moose country home at Oelwein in honor of Dr. Elizabeth Smith-Kennedy, Oelwein, a life member of the Iowa State Medical Society who has practiced medicine for 55 years. Her two daughters and a niece whom she reared are also physicians. ——Dr. Arthur Steindler, Iowa City, was a guest of honor at a reception given in Iowa City by the fraternity, Phi Epsilon Pi. Dr. Steindler was head of the department of orthopedic surgery at the State University of Iowa College of Medicine, Iowa City, from 1927 until 1949. Since then, he has continued to practice at Mercy and University hospitals, Iowa City, and to lecture weekly to medical students.

KENTUCKY

Personal.—Dr. William S. Reeves, Hillsboro, was honored at "Dr. Reeves Day" by citizens of Fleming County, where he has spent 44 of his 64 years of practice. On Aug. 9 last year, a few days after his 90th birthday, Dr. Reeves delivered four babies.

Testimonial Dinner for Dr. Underwood.—The Kentucky State Medical Association recently sponsored a testimonial dinner for Dr. E. Bruce Underwood, Louisville, for many years a member of the A. M. A. House of Delegates, who has resigned as state health commissioner and as secretary-general manager of the Kentucky State Medical Association (THE JOURNAL, Jan. 14, page 123). Dr. Woodford B. Troutman, Louisville, is serving as acting secretary of the association and acting editor of the state medical journal.

MASSACHUSETTS

Medicolegal Course.—The Boston University School of Law, 11 Ashburton Pl., on Feb. 2 inaugurated lectures on the medical and legal aspects of personal injury cases designed for senior students at the law school and practicing members of the bar. The sessions, which meet on Thursdays, 12:30 p. m., will consider "The Surgeon in Court," "Medicolegal Aspects of Psychiatry," "Use of X-Ray in Court," "Injuries to the Back," "The Pathologist in Personal Injury Cases," "Trial of Workmen's Compensation Case," and "Heart Disease—Cause and Effect." Medical lecturers scheduled to lead discussions include Dr. William E. Browne, staff consultant in surgery at Carney Hospital, Boston; Dr. Samuel S. Hanflig, orthopedic surgeon at Beth Israel Hospital, Boston, and Mount Auburn Hospital, Cambridge; Dr. Harry L. Kozol, visiting neurologist at Boston City Hospital; Dr. Henry H. Lerner, Boston, radiologist with the Massachusetts Division of Industrial Accidents; Dr. J. Stewart Rooney, pathologist and medical director at Parker Hill Medical Center; and Dr. Norman A. Welch, chief physician at Carney Hospital. Edward J. Voke of the Massachusetts Superior Court will preside at the concluding session, a personal injury trial, Saturday, March 24, 10 a. m. Dr. Samuel Lowis, Boston, neurosurgeon, and Dr. Robert R. Shapiro, Boston, orthopedic surgeon, will be witnesses for the plaintiff, and Dr. Storer P. Humphreys, Boston, neurosurgeon, will appear as witness for the defendant. For information contact Prof. Robert H. Anderson, assistant dean, at the law school.

NEW YORK

Society News.—"Highlights in the Management of Diabetes" will be presented by Dr. Garfield G. Duncan, clinical professor of medicine, Jefferson Medical College of Philadelphia, at the meeting of the Medical Society of the County of Kings and Academy of Medicine of Brooklyn, Feb. 21, in the McNaughton Auditorium, Brooklyn. Discussion will be by Dr. George E. Anderson, clinical professor of medicine, State University of New York College of Medicine at New York City, Brooklyn.

Meeting of Chest Physicians.—The annual clinical meeting of the New York state chapter of the American College of Chest Physicians, Feb. 17-18, will open at the Park-Sheraton Hotel, New York City, Friday at 9 a. m. with a motion picture, "Principles of Respiratory Mechanics." The luncheon address, "Chronic Organizing Pneumonias," by Drs. Harold L. Israel and William J. Beckfield, Philadelphia, will be preceded by "Prognosis in Unresected Bronchogenic Carcinoma" by Dr. Katharine R. Boucot, Philadelphia. A session will open at 2 p. m. with a panel discussion, "Stumping the Experts," moderated by Dr. David M. Spain, Brooklyn. Drs. Harry L. Katz, Harold Lyons, Brooklyn, and Coleman B. Rabin, New York City, will be collaborators. The Saturday session will be held at the Tuberculosis Building of the Kings County Hospital, Clarkson Avenue near East 39th Street, Brooklyn. The following small group demonstrations have been scheduled for 10 a. m.: pneumoperitoneum clinic (limited to 10 visitors); total lung function studies (limited to 10 visitors); bronchospirometry demonstration (limited to 5 visitors); angiogram, cardiac catheterization (limited to 5 visitors); and unusual chest x-rays (unlimited). A combined medical and surgical chest conference at 11:15 a. m. will be followed by a complimentary luncheon. For reservations communicate with Dr. Harry Golembe, 10 Chestnut St., Liberty, before Feb. 18.

New York City

Tumor Clinic Conference.—Dr. Willet F. Whitmore Jr., attending surgeon, urologic service, Memorial Center for Cancer and Allied Diseases, will present "Surgical Treatment of Bladder Cancer" at the tumor clinic conference in the Women's Pavilion, Harlem Hospital, Feb. 15, 10:45 a. m.

Alumni Day.—The New York University College of Medicine-Bellevue Medical Center, 550 First Ave., New York 16, will observe alumni day Feb. 22. At 2:30 p. m. an address will be delivered by Dr. George E. Armstrong, director of the medical center and former surgeon general, U. S. Army.

Lectures to the Laity.—In its 21st series of Lectures to the Laity, the New York Academy of Medicine, 2 E. 103rd St., will present the George R. Siedenburg Memorial Lecture, "Whither Mankind" by John W. Dodds, Ph.D., Litt. D., director, special programmes in humanities, Stanford University, Calif., at 8:30 p. m., Feb. 15.

Harvey Lecture.—Dr. Efraim Racker, chief, division of nutrition and physiology, the Public Health Research Institute of the City of New York, will deliver the sixth Harvey Lecture of the 1955-1956 series at the New York Academy of Medicine Feb. 16 at 8:30 p. m. His subject will be "Macro and Microcycles in Carbohydrate Metabolism."

Seminars on History of Surgery.—On Feb. 15, 8:30 p. m., Mount Sinai Hospital (Fifth Avenue and One Hundredth Street) will present the fourth seminar meeting on the history of surgery in conference room P in the basement of the Guggenheim Pavilion. Guests are invited. "Early Osteologists" will be considered by Dr. Ernest S. Barash and "Development of the Surgical Treatment of Peptic Ulcer" by Dr. Isadore Kreel, Toronto, Canada.

OHIO

University News.—Dr. N. Paul Hudson resigned as dean of the Graduate School, Ohio State University, Columbus, Jan. 1, and returned to his position as research professor in the department of bacteriology.

Society News.—On Feb. 15, 8 p. m., at the Cincinnati Sanitarium, 5642 Hamilton Ave., the Cincinnati Society of Neurology and Psychiatry will present Dr. Paul E. Huston, professor of psychiatry, State University of Iowa College of Medicine, Iowa City, who will consider "The Effects of Amytal and Benzedrine on Symptoms of Schizophrenia and Depression."

Rachford Lectures.—The 24th annual series of the Benjamin Knox Rachford Lectureships will take place in Cincinnati on the evenings of Feb. 14 and 15 in the auditorium of the Children's Hospital Clinic and Research Building. Dr. Robert J. Huebner of the National Microbiological Institute in Bethesda, Md., will lecture on "Opportunities and Problems of Modern Virus Research" and "The APC and Coxsackie Virus Infections of Childhood."

OKLAHOMA

Postgraduate Courses.—The University of Oklahoma School of Medicine, Oklahoma City, will offer a course on ulcers of the stomach and duodenum, Feb. 17-18, 3:30-8:30 p. m., with Drs. Gordon P. McNeer, New York, Thomas E. Machella, Philadelphia, Rudolf Schindler, Los Angeles, and Kenneth W. Warren, Boston, as speakers.

PENNSYLVANIA

Personal.—Dr. William C. Adamson, for the past four years director of the Community Guidance Center in Austin, Texas, has been named director of the Child Study, Treatment and Research Center of the Woods Schools at Langhorne.——Dr. Jack A. Wolford has left his post as clinical director of the Warren State Hospital to become superintendent of the Hastings State Hospital, Ingleside, Neb.——Dr. Elizabeth Q. St. John, Feasterville, has been named associate medical director of the Fidelity Mutual Life Insurance Company. Before joining the company's medical department in 1933, Dr. St. John was associated with the Food Research Laboratory, U. S. Bureau of Chemistry. From 1911 to 1925, she was clinical pathologist of the Dufur Hospital, Ambler.

Grants in Pulmonary Disease.—The Pennsylvania Tuberculosis and Health Society grants funds through its medical section, the Pennsylvania Trudeau Society, to assist physicians and investigators in carrying out research in clinical, laboratory, and related fields of investigation of tuberculosis and pulmonary disease. Research grants are awarded for one year to the university, college, or hospital within the state of Pennsylvania in which the studies will be carried out. Applications should be submitted to the executive director before the first day of January, April, July, or October for review by the research committee at their quarterly meeting. No fixed amount is specified but, except in unusual circumstances, the maximum amount awarded for a single grant is $3,000. Small allowances may be made for travel and publications directly related to the research for which a grant is awarded. Ordinarily it is assumed that the salary of the principal investigator, if any, will be paid by the university or institution in which the investigation is carried out. Exceptions can be made at the discretion of the executive committee. Application forms, which may be obtained from the Pennsylvania Tuberculosis and Health Society, 311 S. Juniper St., Philadelphia 7, must be signed by the principal investigator and by the financial officer of the institution responsible for disbursement of the funds granted.

Philadelphia

Bedell Lecture.—At the eighth annual clinical conference of the staff and the Wills Eye Hospital Ex-Resident Society, Feb. 17 and 18, the Bedell Lecture, "Progressive Bilateral Exophthalmos: Differential Diagnosis and Treatment," will be delivered by Dr. Albert D. Ruedemann, Detroit. The program will also include a color television program sponsored by Smith, Kline & French Laboratories, presenting ocular surgery, case presentations, and demonstrations of procedures and techniques. On Friday evening there will be an informal reception and supper for the ophthalmologists and their wives. The Wills Eye Hospital Ex-Resident Society will hold its annual meeting and dinner at the Union League, Philadelphia, on Saturday at 6:30 p. m.

WASHINGTON

Institute on Psychological Testing.—An institute on psychological testing for physicians at Seattle University, Feb. 17-18, will be conducted by Ruth J. Levy, Ph.D., recent president of the Washington State Psychological Association and currently on the staff of the Seattle University department of psychology. The course has been accepted for category no. 1 credit (formal) by the American Academy of General Practice. Lectures and discussion will last from 9 a. m. until 4 p. m. in the conference room of the new Student Union Building at Eleventh and Madison Sts., Seattle. The fee will be $25 for the two days.

WISCONSIN

Orthopedic Field Clinics.—The Bureau for Handicapped Children, state department of public instruction, announces the following schedule for orthopedic field clinics in February: Ashland, Feb. 15-16, and Manitowoc, Feb. 23-24. The clinics are conducted for persons under 21 years of age who are referred by their family physician for orthopedic diagnosis and consultation. Forms for referral may be obtained from the Bureau for Handicapped Children, 146 North, State Capitol, Madison 2.

WYOMING

Student Health Physician Needed.—The University of Wyoming is seeking a director for its student health service, since the present director is nearing retirement age. Salary will be approximately $10,000 per annum, with a month's vacation and some other perquisites, details of which may be obtained from President George D. Humphrey, Ph.D., University of Wyoming, Laramie. Wyoming licensure is required.

ALASKA

Personal.—Dr. C. Earl Albrecht, Juneau, commissioner of health for Alaska, has been named assistant director of the Ohio Department of Mental Hygiene and Correction in Columbus, of which Dr. John D. Porterfield III is director.——Dr. Francis J. Phillips, medical director, Seward Sanatorium, Bartlett, has been appointed a member of the Alaska Hospital Advisory Council. Dr. Phillips will represent the Alaska Territorial Medical Association on the council.

Annual Territorial Meeting at Anchorage.—The Alaska Territorial Medical Association will hold its 11th annual meeting at the Alaska Native Health Service Hospital in Anchorage, Feb. 20-22, under the presidency of Dr. Milo H. Fritz of that city. All physicians are cordially invited to attend. Guest speakers and their first presentations include:

Leonard W. Larson, Bismarck, N. D., Member of Board of Trustees, A. M. A., Medical Association Problems and Responsibilities.

Robert L. King, Seattle, chief of department of medicine, Mason Clinic, Prevention, Diagnosis, and Treatment of Rheumatic Fever.

William J. Steenrod Jr., Seattle, section of metabolism, division of medicine, Mason Clinic, An Approach to Fluid and Electrolyte Problems.

Roger Anderson, Seattle, senior consultant in orthopedic surgery, University of Washington School of Medicine, Backache With or Without Sciatic Radiation, Facile Diagnosis and Practical Method of Management.

William M. M. Kirby, Seattle, professor of medicine, University of Washington School of Medicine, Recent Developments in Antibiotic Therapy.

The convention has been scheduled to coincide with the Anchorage Fur Rendezvous, the city's annual winter festival. Among activities in which visitors may participate or which they may witness are dog sled races, Eskimo dances, ice skating and skiing events, raw fur auction, Coronation Ball at which the Queen of the Rendezvous is chosen, Miners and Trappers Ball, and beard-judging contest. Exhibits of historic interest and of arts and crafts will be on display. Social events include a gathering for all members, wives and guests, with the Anchorage Medical Society as host, to be held at the Doctor's Clinic Monday evening, and the annual association banquet at the Idle Hour Country Club, Tuesday evening.

GENERAL

Nominations for Criss Award.—Nominations for the Dr. C. C. Criss award will be accepted until March 1 by the Mutual Benefit Health and Accident Association of Omaha, which presents the award ($10,000 and a gold medal) annually for "the outstanding contribution during the year to public health and/or safety." The 1955 award went to Dr. Jonas E. Salk of Pittsburgh. Nominations may be submitted to Mr. Charles E. Ingram, district manager, Mutual of Omaha.

Richard Kovacs Memorial Fellowship Fund.—The Richard Kovacs Memorial Fellowship fund, established to help defray the expenses of one or two qualified persons wishing to attend the second International Congress of Physical Medicine, Aug. 20-24, Copenhagen, Denmark, will accept applications until March 1. Letters should be directed to the Richard Kovacs Memorial Fellowship Fund Committee, American Congress of Physical Medicine and Rehabilitation, 30 N. Michigan Ave., Chicago 2.

Annual Heart Fund Campaign.—On the eve of the 1956 Heart fund campaign, General Mark W. Clark, national campaign chairman, announced that the total raised in the 1955 Heart appeal was $13,575,963—or nearly 20% more than the $11,330,195 raised in 1954. The first Heart fund, in 1949, raised $2,665,776. This year Heart Sunday will be observed on Feb. 26 in more than 5,000 cities and towns across the country. Income from the fund is the major support of the scientific research, education, and community service programs of the American Heart Association, its 57 affiliates, and 350 chapters. More than 54% of the funds received from the 1955 appeal by the national office of the association will be spent for research.

Postgraduate Medical Assembly.—The Mid-South Postgraduate Medical Assembly will convene in the Hotel Peabody, Memphis, Tenn., Feb. 14-17. Speakers will include Drs. William Perrin Nicolson Jr., Atlanta, Ga.; Rudolf J. Noer, Louisville, Ky.; Harry Bakwin, Cornelius P. Rhoads, and Frank Glenn, New York City; Kenneth L. Pickrell and William M. Coppridge, Durham, N. C.; Henry G. Schwartz and Bertrand Y. Glassberg, St. Louis; Arthur Grollman, Dallas, Texas; Thaddeus S. Danowski, Pittsburgh; Albert Segaloff, New Orleans; George L. Sackett, Cleveland; Warren E. Wheeler and John C. Ullery, Columbus, Ohio; Edward D. Allen, Chicago; Alson E. Braley, Iowa City; William H. Bickel, Rochester, Minn.; and David E. S. Wishart, Toronto, Canada.

Surgeons Meet in Philadelphia.—The American College of Surgeons will hold its Philadelphia sectional meeting Feb. 13-16 at the Bellevue-Stratford Hotel. The scientific sessions will be preceded each day by hospital clinics, 8-10 a. m. Panel discussions will include: Hand Injuries, Dr. Michael L. Mason, Chicago, moderator; Surgical Lesions of the Stomach, Dr. Samuel F. Marshall, Boston, moderator; Peripheral Vascular Surgery, Dr. Charles A. Hufnagel, Washington, D. C., moderator; and Biliary Tract Surgery, Dr. John H. Mulholland, New York City, moderator. The following symposiums have been scheduled: Management of Mass Casualties; Surgery of the Neck; Diseases of the Breast; and Lesions of the Esophagus. Wives and guests are invited to the informal dinner, Monday, 6 p. m., at which Dr. Paul R. Hawley, Chicago, director, American College of Surgeons, will deliver an address; a motion picture "Danger at the Source" will be shown; and Kenneth McFarland, Ph.D., Topeka (appearing through courtesy of General Motors) will give a talk entitled "Lamp Lighters." A motion picture symposium will be presented Tuesday, 8-10 p. m.

Fellowships for Health Educators.—The National Foundation for Infantile Paralysis will continue to offer a number of fellowships to provide educational opportunities for health educators employed in state departments of education or of health. Applicants must have obtained their bachelor's or higher degree from an accredited institution and have had substantial training in biological science and education or other social sciences. Only those who have had a minimum of two years of experience as educators in the field of health will be eligible. Citizenship in the United States as well as sound health are prerequisites. The program of study may be undertaken at any school of public health in the United States that offers a graduate program in health education and is approved by the American Public Health Association. The candidate must make his own arrangements with the institution for a program of study and field training to supplement his previous background and to prepare him more adequately for the responsibilities of a health educator. Financial assistance will be given for tuition and maintenance, depending on individual need as determined by marital status and number of dependents. Applications may be submitted at any time, but for consideration in May they must be received by March 1; for action in November by Sept. 1; and for consideration in February by Dec. 1. For information address: Division of Professional Education, National Foundation for Infantile Paralysis, 120 Broadway, New York 5.

Fulbright Awards for India.—Announcement is made of United States government grants for university lecturing and advanced research in India during the academic year 1956-1957, authorized under the Fulbright Act. Applications should be postmarked no later than Feb. 20 and should be sent to the Conference Board of Associated Research Councils, Committee on International Exchange of Persons, 2101 Constitution Ave. N. W., Washington 25, D. C. While selections probably will be made by June, because of the lateness of the announcement, grantees will not be expected to arrive in India until July or August. The 15 awards offered for visiting lecturers include awards in educational psychology and guidance and in physical education and 5 awards in unspecified fields, including medicine, anatomy, ophthalmology, and internal medicine. University lecturers are expected to have had at least one year's college or university teaching experience. The grants are limited to citizens of the United States. The terms of award include round-trip transportation for the grantee but not for accompanying members of his family; a maintenance allowance based on the cost of living in India, which may be adjusted to take into account up to four accompanying dependents; and an incidental allowance, for the purchase of books, educational supplies, local travel, or services essential to the success of the grantee's project. University lecturers will, in addition, receive a supplemental grant of $500 for the full academic year.

Industrial Physicians Meet in Cincinnati.—The American Academy of Occupational Medicine will hold its eighth annual meeting at the Netherland Plaza Hotel, Cincinnati, Feb. 15-17. Physician faculty members, University of Cincinnati College of Medicine, will present the following papers: The Skin, Raymond R. Suskind; Respiratory System, Virgil A. Plessinger; Circulatory System, Arnold Iglauer; Hemopoietic System, Karl V. Kitzmiller; Liver and Gastrointestinal System, Stuart A. Safdi; Genitourinary System, John W. Hauser; Central Nervous System, John Campbell; Man as a Whole, W. Donald Ross; Private and University Laboratories, Robert A. Kehoe; Early Treatment of Hand Injuries, Vinton E. Siler; Diagnosis and Treatment of Back Pain—Evaluation of Ability to Work, Robert Perlman. Thursday morning Dr. Mitchell R. Zavon, director of the bureau of industrial health, Cincinnati Health Department, will discuss local agencies; Dr. Thomas F. Mancuso, Columbus, Ohio, chief, division of industrial hygiene, State of Ohio Department of Health, will talk on the state department of health; and Dr. W. Clark Cooper, chief, Occupational Health Field Headquarters, Cincinnati, will consider the United States Public Health Service. In observation of its 10th anniversary, the academy will present the first George H. Gehrmann Lecture in the ballroom of the Cincinnati Club Thursday evening. Mr. Emile F. du Pont, director, E. I. du Pont de Nemours and Company, Wilmington, Del., will be the speaker. Friday morning "The Economic Aspects of Industrial Medical Programs" will be presented by Dr. Mark S. Blumberg, occupational health program, Division of Special Health Services, U. S. Public Health Service, Washington, D. C.; "Treatment of Methemoglobinemia" by Dr. Arthur F. Mangelsdorff, American Cyanamid Company, Bound Brook, N. J.; and "Clinical Effects Associated with Heliarc Welding" by Dr. Morris Kleinfeld, Brooklyn, N. Y., assistant director, Division of Industrial Hygiene, New York State Department of Labor. The presidential address will be delivered at 2 p. m.

CORRECTION

Transilluminators for Retinal Detachment and Surgery.—The C. R. I. germicide mentioned in the Clinical Note by Dr. Conrad Berens, on page 1532, THE JOURNAL, Dec. 17, 1955, in the right-hand column and in a footnote, is made by Clay-Adams, Inc., New York City, and not by the Storz Instrument Co., St. Louis, as previously reported by the author.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1956 Annual Meeting, Chicago, June 11-15.

1956 Clinical Meeting, Seattle, Nov. 27-30.

1957 Annual Meeting, New York, June 3-7.

1957 Clinical Meeting, Philadelphia, Dec. 3-6.

1958 Annual Meeting, San Francisco, June 23-27.

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE, Palmer House, Chicago, Feb. 11-14. Dr. Edward L. Turner, 535 N. Dearborn St., Chicago 10, Secretary.

NATIONAL CONFERENCE ON RURAL HEALTH, Multnomah Hotel, Portland, Ore., Mar. 8-10. Mrs. Arline Hibbard, 535 N. Dearborn St., Chicago 10, Secretary.

ALASKA TERRITORIAL MEDICAL ASSOCIATION, Alaska Native Health Service Hospital, Anchorage, Feb. 20-22. Dr. Robert B. Wilkins, 1121 Fourth Ave., Anchorage, Secretary.

AMERICAN ACADEMY OF FORENSIC SCIENCES, Drake Hotel, Chicago, Feb. 23-25. Dr. Walter J. Camp, 1853 West Polk St., Chicago, Secretary.

AMERICAN ACADEMY OF GENERAL PRACTICE, Hotel Statler, Washington, D. C., Mar. 19-22. Mr. Mac F. Cahal, Broadway at 34th Street, Kansas City 11, Mo., Executive Secretary.

AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE, Netherlands-Plaza Hotel, Cincinnati, Feb. 15-17. Dr. Leonard J. Goldwater, 600 W. 168th St., New York 32, Secretary.

AMERICAN ASSOCIATION OF ANATOMISTS, Milwaukee, Apr. 4-6. Dr. Normand L. Hoerr, 2109 Adelbert Rd., Cleveland 6, Secretary.

AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION, RECREATION, Conrad Hilton Hotel, Chicago, Mar. 24-30. Mr. Carl A. Troester Jr., 1201 Sixteenth St., N.W., Washington 6, D. C., Executive Secretary.

AMERICAN ORTHOPSYCHIATRIC ASSOCIATION, Hotel Commodore, New York, Mar. 15-17. Dr. Marion F. Langer, 1790 Broadway, New York 19, Executive Secretary.

AMERICAN PSYCHOSOMATIC SOCIETY, Sheraton Plaza, Boston, Mar. 24-25. Dr. Theodore Lidz, 333 Cedar St., New Haven 11, Conn., Secretary.

AMERICAN SOCIETY OF MAXILLOFACIAL SURGEONS, Jung Hotel, New Orleans, Mar. 18-21. Dr. John A. Drummond, 1414 Drummond St., Montreal, Canada, Secretary.

CENTRAL SURGICAL ASSOCIATION, Hotel Kahler, Rochester, Minn., Feb. 23-25. Dr. Charles D. Branch, 102 North St., Peoria, Ill., Secretary.

CHICAGO MEDICAL SOCIETY ANNUAL CLINICAL CONFERENCE, Palmer House, Chicago, Feb. 28-March 2. Dr. Norris J. Heckel, 86 E. Randolph St., Chicago 1, Secretary.

DALLAS SOUTHERN CLINICAL SOCIETY, Dallas, Tex., Mar. 12-14. Miss Helga Boyd, 433 Medical Arts Bldg., Dallas 1, Tex., Executive Secretary.

EASTERN CONFERENCE OF RADIOLOGISTS, Lord Baltimore Hotel, Baltimore, Mar. 15-17. Dr. Richard B. Hanchett, 705 Medical Arts Bldg., Baltimore 1, Secretary.

EASTERN SECTION, AMERICAN CONGRESS OF PHYSICAL MEDICINE AND REHABILITATION, Hotel Adelphia, Philadelphia, April 7. Dr. Harold Lefkoe, 1006 Medical Tower, Philadelphia 3, Secretary.

MICHIGAN CLINICAL INSTITUTE, Sheraton-Cadillac Hotel, Detroit, Mar. 7-9. Dr. L. Fernald Foster, 606 Townsend St., Lansing 15, Secretary.

MICROCIRCULATORY CONFERENCE, Hotel Schroeder, Milwaukee, Apr. 3. Dr. George P. Fulton, Boston University, College of Liberal Arts, 725 Commonwealth Ave., Boston 15, Chairman.

NATIONAL MULTIPLE SCLEROSIS SOCIETY, New York, March 13. Mr. Sidney L. Smith, Suite 7 G, 270 Park Ave., New York 17, Secretary.

NEW ORLEANS GRADUATE MEDICAL ASSEMBLY, Municipal Auditorium, New Orleans, Feb. 27-March 1. Dr. Eugene H. Countiss, Room 103, 1430 Tulane Ave., New Orleans 12, Director.

REGIONAL MEETINGS, AMERICAN COLLEGE OF PHYSICIANS:

LINCOLN, NEB., Cornhusker Hotel, Mar. 3. Dr. Edmond M. Walsh, 1412 Medical Arts Bldg., Omaha 2, Neb., Chairman.

HONOLULU, HAWAII, March 6. Dr. Nils P. Larsen, 1133 Punchbowl St., Honolulu 13, Hawaii, Governor.

KANSAS CITY, KANS., Mar. 23. Dr. William C. Menninger, 317 West 6th Ave., Topeka, Kans., Governor.

SOUTHERN ILLINOIS, SPRINGFIELD, March, March 24. Dr. Charles H. Drenckhahn, 602 West University Ave., Urbana, Illinois, Governor.

SECTIONAL MEETINGS, AMERICAN COLLEGE OF SURGEONS:

PHILADELPHIA, The Bellevue-Stratford, Feb. 13-16. Dr. Calvin M. Smyth Jr., Abington Memorial Hospital, Abington, Pa., Chairman.

MILWAUKEE, Hotel Schroeder, Feb. 27-29. Dr. Forrester Raine, 425 E. Wisconsin Ave., Milwaukee 4, Chairman.

COLORADO SPRINGS, COLO., The Broadmoor, Mar. 5-7. Dr. George W. Bancroft, 106 E. St. Vrain St., Colorado Springs, Colo., Chairman.

LITTLE ROCK, ARK., Hotel Marion, Mar. 12-13. Dr. Joseph F. Shuffield, 103 E. 7th St., Little Rock, Ark., Chairman.

SOUTHEASTERN SECTION, AMERICAN UROLOGICAL ASSOCIATION, Hollywood, Fla., Mar. 25-29. Dr. Robert F. Sharp, 200 Carondelet St., New Orleans 12, Secretary.

SOUTHEASTERN SURGICAL CONGRESS, John Marshall Hotel, Richmond, Va., Mar. 12-15. Dr. Benjamin T. Beasley, 701 Hurt Bldg., Atlanta 3, Ga., Secretary.

SOUTHERN NEUROSURGICAL SOCIETY, George Washington Hotel, Jacksonville, Fla., Mar. 23-24. Dr. William F. Meacham, Vanderbilt University Hospital, Nashville 5, Tenn., Secretary.

SYMPOSIUM ON FUNDAMENTAL CANCER RESEARCH, Texas Medical Center, Houston, Texas, Mar. 29-31. Dr. Grant Taylor, University of Texas, Postgraduate School of Medicine, Houston, Texas, General Chairman.

U. S. SECTION, INTERNATIONAL COLLEGE OF SURGEONS, REGIONAL MEETING, Greenbrier Hotel, White Sulphur Springs, W. Va., Feb. 12-15. Dr. E. G. Gill, 711 South Jefferson St., Roanoke, Va., Chairman.

FOREIGN AND INTERNATIONAL

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS, London School of Hygiene and Tropical Medicine, London W.C.1, England, Sept. 24-28, 1956. Dr. J. A. A. Mekelburg, Peek, Frean and Company, Ltd., Keetons Rd., Bermondsey, London, S.E.16, England, Honorable Secretary.

BRITISH MEDICAL ASSOCIATION, Brighton, England, July 9-13, 1956. Dr. Angus Macrae, B. M. A. House, Tavistock Square, London, W.C.1, England.

CANADIAN MEDICAL ASSOCIATION, Quebec, P. Q., Canada, June 10-14, 1956. Dr. Arthur D. Kelly, 150 St. George St., Toronto 5, Ont., Canada, Secretary.

CONFERENCE OF INTERNATIONAL UNION FOR HEALTH EDUCATION OF THE PUBLIC, Rome, Italy, April 27-May 5, 1956. Mr. Lucien Viborel, 92 rue St. Denis, Paris 1er, France, Secretary-General.

CONGRESS OF FRENCH SOCIETY OF OPHTHALMOLOGY, Paris, France, May 6-10, 1956. Dr. Marcel Kalt, 81 rue Saint-Lazare, Paris 9e, France, Secretary.

CONGRESS OF INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, Miami Beach, Fla., U.S.A., April 9-12, 1956. For information write: Dr. R. J. Whitacre, 13951 Terrace Road, Cleveland 12, Ohio, U. S. A.

CONGRESS OF INTERNATIONAL ASSOCIATION OF LIMNOLOGY, Helsinki, Finland, July 26-Aug. 7, 1956. For information address: Dr. H. Luther, Snellmansgatan 16 C 36, Helsinki, Finland.

CONGRESS OF INTERNATIONAL ASSOCIATION OF LOGOPEDICS AND PHONIATRICS, Barcelona, Spain, Sept. 3-7, 1956. Dr. J. Perello, Provenza 319, Barcelona 9, Spain, Secretary-General.

CONGRESS OF INTERNATIONAL SOCIETY OF HEMATOLOGY, Hotel Somerset, Boston, Mass., U.S.A., Aug. 27-Sept. 1, 1956. Dr. W. C. Moloney, 39 Bay State Road, Boston, Mass., U.S.A., Secretary.

CONGRESS OF INTERNATIONAL UNION AGAINST TUBERCULOSIS, New Delhi, India, Jan. 3-6, 1957. For information address: Secretariat, The Union, 66 Boulevard Saint-Michel, Paris 6e, France.

CONGRESS OF LATIN SOCIETY OF OPHTHALMOLOGY, Madrid, Spain, April 24-28, 1956. For information address: Dr. Costi, Montalban 3, Madrid, Spain.

EUROPEAN CONGRESS OF ALLERGOLOGY, Florence, Italy, Sept. 12-15, 1956. Prof. Umberto Serafini, Instituto de Patologia Medica, Viale Morgagni, Florence, Italy, Secretary-General.

EUROPEAN CONGRESS OF CARDIOLOGY, Stockholm, Sweden, Sept. 10-14, 1956. Dr. Karl Erik Grewin, Sodersjukhuset, Stockholm, Sweden, General Secretary.

EUROPEAN SYMPOSIUM ON VITAMIN B_{12}, Hamburg, Germany, May 22-26, 1956. For information write: Doz. Dr. H. Bauer, Nervenklinik, Hamburg-Eppendorf, Germany.

HEALTH CONGRESS, ROYAL SOCIETY FOR THE PROMOTION OF HEALTH, Blackpool, England, April 24-27, 1956. Mr. P. Arthur Wells, 90 Buckingham Palace Road, London S.W. 1, England, Secretary.

INTER-AMERICAN CONGRESS OF CARDIOLOGY, Havana, Cuba, Nov. 4-10, 1956. For information address: Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

INTERNATIONAL ACADEMY OF PATHOLOGY, Cincinnati, Ohio, U. S. A., April 24-25, 1956. Dr. F. K. Mostofi, Armed Forces Institute of Pathology, Washington 25, D. C., U. S. A., Secretary.

INTERNATIONAL CONGRESS AGAINST ALCOHOLISM, Istanbul, Turkey, Sept. 10-15, 1956. For information address: International contre l'Alcoolisme, Case Gare 49, Lausanne, Switzerland.

INTERNATIONAL CONGRESS ON ANIMAL REPRODUCTION, Arts School, University of Cambridge, Cambridge, England, June 25-30, 1956. Dr. Joseph Edwards, Production Division, Milk Marketing Board, Thames Ditton, Surrey, England, Hon. Secretary.

INTERNATIONAL CONGRESS OF ANTHROPOLOGICAL AND ETHNOLOGICAL SCIENCES, Philadelphia, Pa., U. S. A., Sept. 2-9, 1956. Dr. William N. Fenton, National Research Council, Division of Anthropology and Psychology, 2101 Constitution Avenue, Washington 25, D. C., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS OF DIETETICS, Congress Palace, Esposizione Universale Roma, Rome, Italy, Sept. 10-14, 1956. Prof. E. Serianni, Associazione Dietetica, Italiana, via dei Penitenzieri N. 13, Rome, Italy, Secretary General.

INTERNATIONAL CONGRESS ON DISEASES OF THE CHEST, Cologne, Germany, Aug. 19-23, 1956. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Illinois, U. S. A., Executive Director.

INTERNATIONAL CONGRESS OF ENTOMOLOGY, Montreal, Canada, Aug. 17-25, 1956. Mr. J. A. Downes, Science Service Bldg., Carling Ave., Ottawa, Ont., Canada, Secretary.

INTERNATIONAL CONGRESS OF GASTROENTEROLOGY, London, England, July 18-21, 1956. Mr. Hermon Taylor, London Hospital, White Chapel, London E.1, England, Honorable Secretary.

INTERNATIONAL CONGRESS OF HEALTH TECHNICIANS, Maison de la Mutualite, Paris, France, June 5-8, 1956. For information address: Mr. M. H. Thoillier, 37 Rue de Monthlon, Paris 9e, France.

INTERNATIONAL CONGRESS FOR THE HISTORY OF SCIENCE, Florence and Milan, Italy, Sept. 3-10, 1956. Dr. M. L. Bonelli, Instituto di Ottica, Arcetri, Florence, Italy, Secretary-General.

INTERNATIONAL CONGRESS OF HUMAN GENETICS, Copenhagen, Denmark, Aug. 1-6, 1956. For information address: The University Institute for Human Genetics, Tagensvej 14, Copenhagen N, Denmark.

INTERNATIONAL CONGRESS OF HYDATID DISEASE, Athens, Greece, Sept. 14-18, 1956. Prof. B. Kourias, Croix-Rouge Hellenique, 1 rue Mackenzie King, Athens, Greece, Secretary-General.

INTERNATIONAL CONGRESS ON INFECTIOUS PATHOLOGY, Lyon, France, May 24-26, 1956. General Secretariat: Institut Pasteur de Lyon, 77 rue Pasteur, Lyon, France.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE, Madrid, Spain, Sept. 19-23, 1956. Dr. J. C. De Oya and Dr. J. Gimena, Hostaleza No. 90, Madrid, Spain, Secretaries.

INTERNATIONAL CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Palmer House, Chicago, Illinois, U. S. A., Sept. 9-13, 1956. Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois, U. S. A., Secretary-General.

INTERNATIONAL CONGRESS ON MEDICAL RECORDS, Shoreham Hotel, Washington, D. C., U. S. A., Oct. 1-5, 1956. For information address: Miss Doris Gleason, Executive Director, American Association of Medical Record Librarians, 510 North Dearborn St., Chicago 10, Illinois, U. S. A.

INTERNATIONAL CONGRESS OF NEO-HIPPOCRATIC MEDICINE, Montecatini, Terme, Italy, May 20-22, 1956. Dr. Valente, 41 Avenue Verdi, Montecatini Terme, Italy, Secretary-General.

INTERNATIONAL CONGRESS OF PAEDIATRICS, Copenhagen, Denmark, July 22-27, 1956. Professor P. Plum, Rigshospitalet, Copenhagen, Denmark, President.

INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE, Copenhagen, Denmark, August 20-24, 1956. Dr. B. Strandberg, Kobenhavns amts sygehus i Gentofte, Dept. of Rheumatology and Physical Medicine, Hellerup, Denmark, Honorable Secretary.

INTERNATIONAL CONGRESS OF RADIOLOGY, Mexico, D. F., Mexico, July 22-28, 1956. Dr. Jose Noriega, Tepic 126 (2e piso), Mexico, D. F. 7, Mexico, Secretary General.

INTERNATIONAL CONGRESS OF WORLD CONFEDERATION FOR PHYSICAL THERAPY, Hotel Statler, New York, New York, U. S. A., June 17-23, 1956. For information address: Miss Mildred Elson, American Physical Therapy Association, 1790 Broadway, New York 19, New York, U. S. A.

INTERNATIONAL GENETICS SYMPOSIUM, Tokyo and Kyoto, Japan, Sept. 6-12, 1956. For information address: Secretary, International Genetics Symposium, Science Council of Japan, Ueno Park, Tokyo, Japan.

INTERNATIONAL PHYSIOLOGICAL CONGRESS, Brussels, Belgium, July 29-Aug. 5, 1956. For information address: Prof. J. Reuse, Faculte de Medicine et de Pharmacie, 115 Boulevard de Waterloo, Brussels, Belgium.

INTERNATIONAL PROFESSIONAL UNION OF GYNECOLOGISTS AND OBSTETRICIANS, Madrid, Spain, Sept. 28-29, 1956. Dr. Jacques Courtois, 1 rue Racine, St-Germain-en-Laye (S and O), France, Permanent International Secretary-General.

INTERNATIONAL SYMPOSIUM ON VENEREAL DISEASES AND THE TREPONEMATOSES, Hotel Statler, Washington, D. C., U. S. A., May 28-June 1, 1956. For information address: Dr. Charles A. Smith, Chief, Venereal Disease Program, Division of Special Health Services, Public Health Service, Dept. of Health, Education and Welfare, Washington 25, D. C., U. S. A.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION, EXTRAORDINARY GENERAL ASSEMBLY, Burgenstock, Nidwalden, Switzerland, Sept. 21-23, 1956. Dr. Janet Aitken, 30a Acacia Road, London N.W. 1, England, Secretary.

MIDDLE EAST MEDICAL ASSEMBLY, Campus, American University of Beirut, Beirut, Lebanon, April 7-9, 1956. Dr. Virgil C. Scott, American University of Beirut, Beirut, Lebanon, Chairman.

NATIONAL CONGRESS OF PEDIATRICS, Cuidad Universitaria, Mexico D.F., Mexico, May 1-5, 1956. Dr. Ignacio Avila Cisneros, Calzada de Madereros No. 240, Mexico 18, D.F., Mexico, Coordinator.

NORTH QUEENSLAND MEDICAL CONFERENCE, Cairns, North Queensland, Australia, June 25-30, 1956. Dr. W. R. Horsfall, P.O Box 672, Cairns, N.Q., Australia, Secretary.

PAKISTAN MEDICAL CONFERENCE, University of Peshawar, Peshawar, Pakistan, Apr. 2-4, 1956. Dr. M. W. Alivi, 9, Braganza House, Napier St., Saddar, Karachi, Pakistan, Secretary General.

PAN AMERICAN CONGRESS ON CANCER CYTOLOGY, Miami, Fla., U. S. A., Jan. 8-12, 1957. Dr. J. Ernest Ayre, 1155 N.W. 14th St., Miami, Fla., U. S. A., General Chairman.

PAN AMERICAN CONGRESS OF GERONTOLOGY, Mexico, D. F., Mexico, Sept. 5-15, 1956. Dr. Manuel Payno, Avenue Cuahtemoc No. 10-3, Mexico 7, D. F., Mexico, Presidente.

PAN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY AND BRONCHOESOPHAGOLOGY, San Juan, Puerto Rico, April 8-12, 1956. Dr. C. E. Munoz MacCormick, Apartado 9111, Santurce 29, Puerto Rico, Secretary General.

PAN AMERICAN MEDICAL WOMEN'S ALLIANCE, Santiago, Chile, March 6-13, 1956. For information address: Dr. Eva Cutright, 458 Beall Ave., Wooster, Ohio, U. S. A.

PAN AMERICAN TUBERCULOSIS CONGRESS, Medellin and Bogota, Columbia, South America, Aug. 1-15, 1956. General Secretary, 26 de Marzo 1065, Montevideo, Uruguay.

WORLD CONGRESS ON FERTILITY AND STERILITY, Naples, Italy, May 18-24, 1956. Dr. Maxwell Roland, 114-20 Queens Boulevard, Forest Hills 75, New York, N. Y., U. S. A., Chairman, Liaison Committee.

WORLD FEDERATION FOR MENTAL HEALTH, Munich, Germany, Aug. 12-18, 1956. Secretariat, 19 Manchester Street, London W.1, England.

WORLD MEDICAL ASSOCIATION, Havana, Cuba, Oct. 9-15, 1956. Dr. Louis H. Bauer, 345 East 46th St., New York 17, New York, U. S. A., Secretary-General.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Various Centers. April 24-25 (Part II); June 19-20 (Parts I and II); September 4-5 (Part I). Candidates may file applications at any time but they must be received at least six weeks before the date of the examination for which application is made. New candidates should apply by formal registration; registered candidates may notify the board, indicating desired location, date and candidate number. Ex. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination* Montgomery, June 19-21. Sec., Dr. D G Gill, State Office Bldg., Montgomery.

ARKANSAS:* *Examination*. Little Rock, June 14-15. Sec., Dr. Joe Verser, Harrisburg.

CALIFORNIA: *Examination.* Los Angeles, Feb. 27-Mar. 1. Sec., Dr. Louis E. Jones, 1020 N St., Room 436, Sacramento.

CONNECTICUT:* *Examination.* New Haven, March 12-14. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven.

DISTRICT OF COLUMBIA:* *Examination.* Washington, May 14-15. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Ave., N.W., Washington.

FLORIDA:* *Examination.* Miami Beach, June 24-26. Sec., Dr. Homer L. Pearson, 901 N.W. 17th St., Miami 36.

GEORGIA: *Examination and Reciprocity.* Atlanta, June. Sec., Mr. Cecil L. Clifton, 111 State Capitol, Atlanta 3.

ILLINOIS: *Examination and Reciprocity.* Chicago, April 3-5, June 19-21 and Oct. 9-11. Supt. of Regis., Mr. Frederic B. Selcke, Capitol Building, Springfield.

INDIANA: *Examination.* Indianapolis, June. Exec. Sec., Miss Ruth V. Kirk, 538 K. of P. Bldg., Indianapolis.

MAINE: *Examination.* Portland, Mar. 13-14. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MICHIGAN:* *Examination.* Ann Arbor and Detroit, June 13-15. Sec., Dr. E. C. Swanson, 118 Stevens T. Mason Bldg., Lansing.

MONTANA: *Examination and Reciprocity.* Helena, April 3. Sec., Dr. S. A. Cooney, 7 West 6th Ave., Helena.

NEBRASKA:* *Examination.* Omaha, June 18-20. Director, Bureau of Examining Boards, Mr. Husted K. Watson, 1009 State Capitol Bldg., Lincoln.

NEW HAMPSHIRE: *Examination and Endorsement.* Concord, March 14-16. Sec., Dr. John S. Wheeler, 107 State House, Concord.

NEW JERSEY: *Examination.* Trenton, June 19-22. Sec., Dr. Patrick H. Corrigan, 28 W. State St., Trenton.

NEW MEXICO:* *Examination and Endorsement.* Santa Fe, May 21-22. Sec., Dr. R. C. Derbyshire, 227 E. Palace Ave., Santa Fe.

NEW YORK: *Examination.* Albany, Buffalo, Syracuse and New York, Feb. 7-10. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany.

OHIO: *Examination.* Columbus, June 14-16. *Endorsement.* Columbus, April 3. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA:* *Examination.* Oklahoma City, June 5-6. Sec., Dr. E. F. Lester, 813 Braniff Bldg., Oklahoma City.

OREGON:* *Reciprocity.* Portland, Apr. 19-21. *Examination.* Portland, July. Ex. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

TEXAS:* *Examination and Reciprocity.* Fort Worth, June 18-20. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: *Reciprocity.* Salt Lake City, Feb. 21. *Examination.* Salt Lake City, July 11-13. Director, Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

WEST VIRGINIA: *Examination.* Charleston, July. *Reciprocity.* Charleston, April 23. Sec., Dr. N. H. Dyer, State Office Bldg. No. 3, Charleston.

WISCONSIN:* *Reciprocity,* Madison, Spring; *Reciprocity and Examination.* Milwaukee, July 10-12. Sec., Dr. Thomas W. Tormey, Jr., 1140 State Office Bldg., Madison.

ALASKA:* On application in Anchorage, Fairbanks, Juneau and other towns. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Sec., Dr. John E. Kennedy, Agana.

PUERTO RICO: *Examination.* San Juan, Mar. 6-10. Sec., Dr. Joaquin Mercado Cruz, Box 3271, San Juan.

VIRGIN ISLANDS: *Examination and Endorsement.* Charlotte Amalie, June 13-14. Sec., Dr. Earle M. Rice, St. Thomas.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: *Examination.* Little Rock, May 4-5. Sec., Mr. S. C. Dellinger, Zoology Department, University of Arkansas, Fayetteville.

DISTRICT OF COLUMBIA: *Examination.* Washington, April 23-24. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Ave. N.W., Washington 6.

FLORIDA: *Examination.* Miami, June 9. Sec., Mr. M. W. Emmel, Box 340, Gainesville.

OKLAHOMA: *Examination and Reciprocity.* Oklahoma City, Mar. 30-31. Sec., Dr. E. F. Lester, 813 Braniff Bldg., Oklahoma City.

OREGON: *Examination.* Portland, March 3; June 2, Sept. 8 and Dec. 1. Dr. Earl M. Pallett, Sec., State Board of Higher Education, Eugene.

RHODE ISLAND: *Examination.* Providence, Feb. 15. Admin. of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

TENNESSEE: *Examination.* Memphis, Mar. 21-22. Sec., Mr. O. W. Hyman, 62 S. Dunlap St., Memphis 3.

TEXAS: *Examination.* Galveston, Dallas, and such other locations as are warranted, April. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

WISCONSIN: *Examination.* Madison, April 7 and Milwaukee, June 2. Final date for filing application is Mar. 30. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

ALASKA: *Examination and Reciprocity.* Anchorage and Juneau, first week of February, April, June, August and November. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

*Basic Science Certificate required.

MAGAZINE–TELEVISION REPORT

The following list of current medical articles in mass-circulation magazines and forthcoming network television programs on medical subjects is published each week only for the information of readers of THE JOURNAL. *Unless specifically stated, the American Medical Association neither approves nor disapproves of the articles and programs reported.*

TELEVISION

Monday, Feb. 20

NBC-TV, 11 a. m.-noon EST. "Home" presents a special filmed report by Howard Whitman on how a wife can help her husband live longer.

ABC-TV, 9:30 p. m. EST. "Medical Horizons" visits the National Hospital for Speech Disorders in New York. Produced in cooperation with the American Medical Association.

MAGAZINES

Family Weekly Magazine, Feb. 5, 1956

"They're Mending Ailing Hearts," by Jerry Klein

Dr. C. Walton Lillehei and associates at the University of Minnesota Medical School have developed a technique for heart surgery that uses the interchange of blood between the patient and a donor.

The American Weekly, Feb. 19, 1956

"How You Can Live 20 Years Longer," by William Kitay

"Aging" specialists have found that much of the damage caused by chronic diseases can either be minimized or prevented entirely. "The secret is early diagnosis coupled with the anticipation of a health breakdown in persons who, either because of heredity or other natural weaknesses, have tendencies to develop certain chronic diseases."

The American Magazine, February, 1956

"I Invent My Own Diseases," by Don Herold

In an article poking fun at health education campaigns that use the fear approach, the author says "we'll all soon be beset by imaginary ills, unless we can as a nation somehow learn mass humor along with this new mass fear."

Pageant, March, 1956

"Your Medical FBI," by Theodore Irwin

The U. S. Public Health Service has 68 "sleuths" in its Epidemic Intelligence Service ready to move into any areas where communicable diseases threaten the United States or its possessions. "What the FBI is to crime, the EIS is to epidemics."

"Poison on Your Dinner Table," by David R. Lindsay

"There are today some 700 to 800 chemical additives available to food processors . . . additional chemicals are fed to livestock or fowl . . . and finally, there are 30,000 registered formulas for insecticides and pesticides which may leave detectable residues in food." The article says that, until Congress increases the government's policing and testing work and requires examinations of the safety of chemical additives before they are put on the dinner table, it is not possible to avoid "danger in your diet."

"But What Will You Die Of?" by Herbert C. Rosenthal

The author has devised a "quiz" that purports to show what chances an individual has of dying of a particular disease. The test is "based on many of the methods used by insurance companies" and gives weighed values to age, sex, weight, heredity, marital status, and other factors.

GOVERNMENT SERVICES

NAVY

Amputee Service Participates in Mexico Meeting.—The Bureau of Medicine and Surgery sent to Mexico City on Jan. 13 an exhibit for the Third Congress of the Latin American Society of Orthopedics and Traumatology, at the invitation of Dr. Alejandro V. Zimbron, president of the congress.

Capt. Thomas J. Canty, M. C., U. S. N., director of the Navy's Prosthetic Research Laboratory at the Naval Hospital, Oakland, and eight of his patients and staff departed Jan. 13 to participate in the congress. Materials for display included the newest types of artificial limbs, a photo montage showing various steps in the Navy rehabilitation program, prosthetic training implements, and occupational therapy projects.

Dr. Canty presented to the congress a paper on "Rehabilitation of Amputees and Modern Artificial Limbs." He also consulted with Mexican government officials, who are setting up a rehabilitation program. Mexico's rehabilitation center, now in the formative stages, will be established with the help of the International Cooperation Administration, which is part of the Foreign Operations Administration.

New Courses Offered to Reserve Officers.—Two new courses are available to inactive Reserve medical department officers enrolled in Naval Reserve Officer's Schools. These courses parallel the correspondence courses on the same subject, and in addition to earning retirement points for attendance, each course provides six points to be credited for purposes of promotion.

Course 184 covers the public information and public relations policies and objectives of the Navy. The course touches on all public information media including press, radio, and television, and emphasizes the importance of community relations.

Course 185 is designed to indoctrinate all officers in the requirements of a sound security system. The course covers the custody, stowage, transmission, and dissemination of classified information. All medical department officers are eligible for enrollment in Naval Reserve Officer's Schools.

Panel Discussion at Naval Hospital.—"Therapeutic Nutrition" was the subject of a panel discussion held at the officers' club of the Naval Hospital, Oakland, Calif., on Jan. 6. Capt. Robert O. Canada, chief of the medical service at the hospital, served as moderator. The subjects covered by the panel were: "Continuous Enteral Feeding of the Chronically Ill" by Dr. James J. Griffitts, president, Blood Banks of America, and director, Medical Research Foundation of Dade County, Miami, Fla.; "The Provision of Calories for the Ill Patient" by Harold A. Harper, Ph.D., associate professor of physiological chemistry, University of California School of Medicine; and "The Intravenous Use of Proteins and Amino Acids" by Lieut. Commander Paul D. Doolan, M. C., U. S. N., chief of the research division and metabolic research facility at Oak Knoll.

Capt. Kellum Receives Award.—Capt. Wilbur E. Kellum, M. C., received the John Jeffries award for 1956 at the annual meeting of the Institute of the Aeronautical Sciences in New York on Jan. 23. The award is given "for outstanding contributions to the advancement of aeronautics through medical research."

The pioneer work of Dr. Kellum has provided valuable data on the use of oxygen equipment in aircraft and in the selection of candidates for flight training. He is responsible, also, for the establishment of night vision training programs in the Navy and the development of air evacuation of wounded personnel. He is commanding officer of the Naval Medical Research Institute, Bethesda, Md.

Training for West Coast Medical Officer Personnel.—A five-day course is scheduled to begin at the Naval Station, Treasure Island, San Francisco, Monday, Feb. 17, and will continue through March 2. This course will present a review of problems relating to the medical aspects of special weapons and radioactive isotopes, with emphasis on their application to military and naval medicine and civil defense. The subjects will be presented by speakers of outstanding prominence in their specialties. Quotas for the course have been authorized for districts 11, 12, and 13. All Naval Reserve medical department officers, male and female, are eligible to attend. No security clearance is required.

Dr. White Guest Lecturer at Medical School.—Dr. Paul Dudley White, Boston, clinical professor at Harvard University Medical School, lectured on "Epidemiological Research in Cardiovascular Disease" at the National Naval Medical Center, Bethesda, Md., Jan. 26. This was the fourth lecture of the naval medical schools' American guest lecture series.

Transfer to Regular Navy.—Lieut. Vincent J. Hyams, Lieut. (j. g.) Lawrence J. Delaney, and Lieut. (j. g.) Richard O. Stader, former Naval Reserve medical officers, were recently commissioned in the Medical Corps of the regular navy.

VETERANS ADMINISTRATION

Residencies in Otolaryngology Available.—There are vacancies for resident training in otolaryngology that include bronchoesophagoscopy, rhinoplasty, and allergy and surgery of otolaryngological cancer at the Veterans Administration Hospital, New York. The residency is approved for three years and is supervised by consultants and attending physicians who are representatives of the dean's committee of the local medical schools. A basic science course is included in this training course and is conducted at Columbia University. The salary is from $2,640 to $3,300 per year. For information write to Liaison Officer, Dean's Committee, Veterans Administration Hospital, 130 W. Kingsbridge Rd., Bronx 68, New York.

Hospital News.—Dr. Arvin E. Trollinger, manager of the VA Hospital in Marion, Ind., has become manager of the Hospital in Lyons, N. J., succeeding Dr. Crawford N. Baganz, who died suddenly Dec. 21, 1955. The Lyons VA Hospital is a 2,000-bed neuropsychiatric hospital.

SELECTIVE SERVICE

Young Physicians Liable for Military Duty.—The medical director of Selective Service has reported that out of nearly 7,000 young men who graduated in medicine in 1955 and who will finish their internships this year about 4,493 are still liable for military duty, having been deferred during their entire medical education. Of these, perhaps 20% will be found physically not qualified for service, leaving about 3,600 qualified for replacement in the armed forces during the fiscal year July 1, 1956, to June 30, 1957. Of these, the Selective Service System has agreed with Dr. Frank B. Berry, Assistant Secretary of Defense (Health and Medical), that 500 will be recommended for deferment for essential residency training on the recommendation of Dr. Berry. This leaves 3,100 available for military service during the fiscal year of 1957.

The Department of Defense has estimated that the three armed forces will require for replacement during the fiscal year of 1957 about 4,600 physicians, and there is an additional requirement for the U. S. Public Health Service. It is claimed that unless the Selective Service System finds additional men in priorities 1 and 2 who are under 46 years of age and available, it will be necessary to call on much older men in priority 3, removing them from established practices.

Certain hospitals are now arranging to appoint some of these young physicians, not recommended by Dr. Berry, to residency training. If such a physician is called on to enter military service at any time during this fiscal year, he will be required to fulfill his obligation. All hospitals have been apprised of the medical situation and the hazard in accepting these young physicians for residency training. About the same number of physicians required for replacement are being released from service each year who have completed their military obligation. Hospitals are free to select from among these men the required number of residents without fear of the training being interrupted for military service.

DEATHS

Morrison, Gordon Mackay ⊕ Kennebunkport, Maine; born in Boston May 28, 1896; Tufts College Medical School, Boston, 1926; formerly president, secretary, and member of the council of the American Association for the Surgery of Trauma; president of the Massachusetts Society of Examining Physicians; a past-governor of the American College of Surgeons; formerly chairman of the Massachusetts Board of Registration in Medicine; served overseas with the Royal Air Force during World War I; formerly on the visiting staff of the Boston City Hospital, on the courtesy staffs of Milton (Mass.) Hospital and Winthrop (Mass.) Community Hospital; consultant, bone and joint surgery, Faulkner Hospital and New England Hospital for Women and Children in Boston, Morton Hospital in Taunton, Mass., St. Joseph's Hospital in Lowell, Mass., Nantucket (Mass.) Cottage Hospital, South Shore Hospital in Weymouth, and Athol (Mass.) Hospital; consultant at the Cape Cod Hospital in Hyannis, Mass., Leonard Morse Hospital in Natick, Mass., and St. John's Hospital in Lowell, Mass.; died in Biddeford Dec. 1, aged 59, of heart disease.

Rinehart, James Fleece ⊕ San Francisco; born in Oakland, Calif., May 7, 1901; University of California School of Medicine, San Francisco, 1927; professor of pathology at his alma mater; specialist certified by the American Board of Pathology; past-president of the American Society for Experimental Pathology; member of the American Society for Clinical Investigation, American Rheumatism Association, American Public Health Association, American Association of Pathologists and Bacteriologists, and College of American Pathologists; fellow of the American Association for the Advancement of Science; in 1942 became a member of the California State Board of Public Health, of which he was vice-president for many years; consultant in pathology at the Langley Porter Clinic and the San Francisco Hospital; chairman of the department of pathology at the University of California Medical Center; on the staff of the Mills Memorial Hospital in San Mateo, where he died Nov. 30, aged 54.

Rosengard, Jerome Livingston ⊕ Stockton, Calif., born in Chicago May 12, 1900; University of Illinois College of Medicine, Chicago, 1926; served during World War II; member of the Illinois State Medical Society; fellow of the American Geriatrics Society, American Association for the Advancement of Science, American Public Health Association, American Heart Association, and the Association of Military Surgeons of the United States; from 1947 to 1952 on the teaching faculty of the Loyola University Stritch School of Medicine in Chicago, where he was a member of the senior staff of the Loretto Hospital; formerly chief of the bureau of venereal disease, cancer control, heart disease, and chronic disease program for the Hawaii Territorial Department of Health in Honolulu; on the staff of the Stockton State Hospital; died Dec. 20, aged 55, of myocardial infarction and coronary occlusion.

Corcoran, William Joseph ⊕ Scranton, Pa.; born in Old Forge, April 4, 1895; Georgetown University School of Medicine, Washington, D. C., 1920; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society, Radiological Society of North America, of which he was vice-president in 1936, and the American College of Radiology; on the staffs of the Farview State Hospital in Waymart, Pa., St. Joseph's Hospital, Carbondale, Pa., and Taylor (Pa.) Hospital, Mercy Hospital, Moses Taylor Hospital, and St. Joseph's Children's and Maternity Hospital; died Dec. 31, aged 60.

Lettenberger, Joseph ⊕ Milwaukee; Wisconsin College of Physicians and Surgeons, Milwaukee, 1896; associate clinical professor of medicine emeritus at Marquette University School of Medicine; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; served during World War I; during his years in Arcadia, served as president of the Trempealeau County Medical Society; on the staffs of St. Luke's and St. Joseph's hospitals; for many years treated children at St. Aemilian's Orphan Asylum; died Nov. 1, aged 80, of myocardial infarction and arteriosclerosis.

Edwards, Thomson ⊕ Drexel Hill, Pa.; born in Philadelphia Aug. 13, 1887; University of Pennsylvania School of Medicine, Philadelphia, 1912; from 1914 to 1916 instructor in surgery at his alma mater; served during World Wars I and II; joined the Veterans Bureau, predecessor of the Veterans Administration, in March, 1921; retired in 1953 as a medical officer of the Veterans Administration after 32 years' service; member of the Association of Military Surgeons of the United States; died in the Veterans Administration Hospital, Philadelphia, Dec. 4, aged 68, of cardiovascular renal disease and cerebral accident.

Selinkoff, J. Jesse ⊕ Wilmington, Del.; George Washington University School of Medicine, Washington, D. C., 1933; past-president of the Delaware Academy of General Practice; member of the American Academy of General Practice and the Association of Military Surgeons of the United States; president of the board of health of the town of Elsmere; member of the board of directors of the Wilmington Child Guidance Clinic; served during World War II; on the staffs of the Wilmington General Hospital, St. Francis Hospital, and the Memorial Hospital; died Nov. 28, aged 46, of coronary occlusion.

Loewy, Paul ⊕ New York City; Medizinische Fakultät der Universität, Vienna, Austria, 1913; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; a medical officer in the Austrian Army during World War I; for many years served with the Rothschild Foundation for Nervous Diseases in Vienna; formerly on the staffs of the Mount Sinai and Beth Israel hospitals; assistant attending neurologist at the Neurological Institute, Columbia-Presbyterian Medical Center, where he died Dec. 9, aged 67, of cerebral hemorrhage.

Mason, Frank Ebaugh, Easton, Md.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1917; interned at the Mercy Hospital in Baltimore; served overseas during World War I; joined the U. S. Public Health Service, later transferring to the Veterans Administration, and served at hospitals in Northampton, Mass., Aspinwall, Pa., White River Junction, Vt., and Fort Howard; served as chief medical officer of the regional office in Cambridge; retired in 1951; on the staff of the Easton Memorial Hospital; died Nov. 20, aged 62.

Adams, Felix M. ⊕ Vinita, Okla.; Barnes Medical College, St. Louis, 1909; specialist certified by the American Board of Psychiatry and Neurology; served as secretary of the Craig County Medical Society; member of the American Psychiatric Association; for many years superintendent of the Eastern State Hospital; in 1955 was inducted into the Oklahoma Hall of Fame; died Dec. 5, aged 71, of coronary thrombosis.

Choate, William Gabrial, Tulsa, Okla.; Eclectic Medical Institute, Cincinnati, 1904; died Oct. 18, aged 71.

Deatherage, William Newton, La Grande, Ore.; University of Arkansas School of Medicine, Little Rock, 1912; died in Portland Nov. 22, aged 77, of myocardial infarction.

Donath, Stephan ⊕ Toledo, Ohio; Medizinische Fakultät der Universität, Vienna, Austria, 1922; member of the American Academy of General Practice; for many years member and at one time chairman of the Washington township board of education; served during World War II; on the staff of the Flower Hospital, where he died Nov. 18, aged 55, of heart disease.

Kennedy, George Walter, Sharon, Pa.; Baltimore Medical College, 1897; an associate member of the American Medical Association; died Sept. 10, aged 86, of arteriosclerosis.

Krecker, William Henry, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1883; died Nov. 15, aged 95, of congestive heart disease and arteriosclerosis.

⊕ Indicates Member of the American Medical Association.

Lominack, Reyburn Williams ✦ Newberry, S. C.; Medical College of the State of South Carolina, Charleston, 1942; member of the American Academy of General Practice; past-president of the Newberry County Medical Society; served during World War II; died Nov. 22, aged 39, of malignant hypertension.

Love, Claude Franklin, Williamsburg, Ohio; Ohio State University College of Medicine, Columbus, 1925; member of the Ohio State Medical Association; veteran of World War I; died Nov. 4, aged 59, of cancer of the throat.

McClellan, Robert Hamilton ✦ Irwin, Pa.; University of Pittsburgh School of Medicine, 1919; specialist certified by the American Board of Pathology; served on the staffs of the Allegheny General and St. Margaret's hospitals in Pittsburgh; died in the Westmoreland Hospital, Greensburg, Sept. 18, aged 63, of coronary disease.

McCormick, Bernard John ✦ Pittsburgh; University of Pittsburgh School of Medicine, 1914; on the staffs of St. Francis General Hospital and St. Joseph's Hospital, where he died Nov. 30, aged 62, of carcinoma of the right ureter.

McDaniel, Guy Lafayette ✦ Henry, Tenn.; National University of Arts and Sciences Medical Department, St. Louis, 1913; on the staff of the Henry County General Hospital in Paris; died Sept. 9, aged 74, of coronary thrombosis.

McLaughlin, Patrick Aloysius, Wilkes-Barre, Pa.; Medico-Chirurgical College of Philadelphia, 1900; an associate member of the American Medical Association; died in the Mercy Hospital Oct. 30, aged 80, of cardiovascular renal disease.

McNish, George Thomas, Mayview, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1899; member of the Medical Society of the State of Pennsylvania; veteran of World War I; served on the staff of the Mayview State Hospital; formerly on the staffs of St. John's Hospital in Pittsburgh and the Henry Clay Frick Memorial Hospital in Mount Pleasant; died in the Canonsburg (Pa.) General Hospital Nov. 8, aged 81, of cancer.

Mathias, John Homer ✦ Lexington, S. C.; Medical College of the State of South Carolina, Charleston, 1912; past-president of the Lexington County Medical Society, of which he was secretary; served on the staffs of the South Carolina Baptist, Columbia, and Providence hospitals in Columbia; died Nov. 19, aged 69, of coronary thrombosis.

Miller, Eugene A. ✦ St. Joseph, Mo.; Ensworth Medical College, St. Joseph, 1914; fellow of the American College of Surgeons; on the staffs of the State Hospital, St. Joseph's Hospital, and the Missouri Methodist Hospital, where he died Dec. 16, aged 68, of bronchopneumonia.

Miller, Samuel ✦ Jamestown, N. D.; University of Minnesota Medical School, Minneapolis, 1929; specialist certified by the American Board of Radiology; member of the Radiological Society of North America, Minnesota State Medical Association, and the American College of Radiology; served during World War II; on the staffs of the Jamestown and Trinity hospitals; died Oct. 12, aged 50, of coronary occlusion.

Milton, Benjamin S. ✦ Chicago; Wisconsin College of Physicians and Surgeons, Milwaukee, 1898; formerly on the faculty of Stritch School of Medicine of Loyola University; for many years a member and past-president on the staff of St. Elizabeth's Hospital, where he died Dec. 22, aged 84, of arteriosclerotic heart disease.

Moore, William Lee, Bokchito, Okla.; Memphis (Tenn.) Hospital Medical College, 1905; College of Physicians and Surgeons, Little Rock, 1911; local surgeon for the Frisco Railroad; at one time practiced in Sasakwa, where he was a member of the city council and mayor; died in the Wilson N. Jones Hospital in Sherman, Texas, Nov. 22, aged 78.

Morrissey, Michael Joseph ✦ Hartford, Conn.; College of Physicians and Surgeons, Baltimore, 1897; specialist certified by the American Board of Dermatology and Syphilology; associated with the Manchester (Conn.) Memorial Hospital, New Britain (Conn.) Hospital, Charlotte Hungerford Hospital in Torrington, Conn., and Institute of Living, and St. Francis Hospital, where he died Dec. 14, aged 79, of coronary sclerosis, lobular pneumonitis, nephrosclerosis, and carcinoma of the prostate.

Neal, Lovell Arthur ✦ Albuquerque, N. M.; University of Illinois College of Medicine, Chicago, 1930; on the staffs of the Presbyterian Hospital Center, St. Joseph Sanatorium and Hospital, and the Bataan Memorial Methodist Hospital; died Nov. 6, aged 53, of acute myocardial infarct.

Nelson, Robert Lyman ✦ Duluth, Minn.; Northwestern University Medical School, Chicago, 1926; specialist certified by the American Board of Internal Medicine; served during World War II; on the staffs of St. Luke's, St. Mary's, and Miller Memorial hospitals; died in Everglades, Fla., Nov. 12, aged 55, of coronary thrombosis.

Noordewier, Albert ✦ Grand Rapids, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901; on the staffs of the Butterworth, St. Mary's, and Blodgett hospitals; died Dec. 1, aged 80, of hypertension and arteriosclerosis.

Nycum, John William ✦ Everett, Pa.; Temple University School of Medicine, Philadelphia, 1929; served during World War II; on the staff of the Memorial Hospital; died Oct. 9, aged 51, of coronary occlusion.

Omelvena, James Gibson ✦ San Diego, Calif.; Rush Medical College, Chicago, 1906; commissioned in the regular U. S. Navy in 1910; served during World War I; resigned his commission as a lieutenant commander in May 1922; on the staff of the Mercy Hospital; died Dec. 7, aged 73, of coronary thrombosis.

Peairs, Ralph Plummer ✦ Normal, Ill.; Rush Medical College, Chicago, 1903; past-president and secretary of the McLean County Board of Health; for many years councilor of the Fifth District of the Illinois State Medical Society; at one time practiced in Milwaukee, where he was medical inspector for the public schools; on the staffs of the Mennonite Hospital in Bloomington and Brokaw Hospital; died Dec. 18, aged 80, of probable coronary occlusion.

Peskind, Samuel ✦ Cleveland; Western Reserve University Medical Department, Cleveland, 1900; died in the Cleveland Clinic Hospital Nov. 19, aged 77, of arteriosclerosis.

Pratt, William Henry, Haddonfield, N. J.; Medico-Chirurgical College of Philadelphia, 1893; also a graduate in pharmacy; formerly practiced in Camden, where he was county coroner and chief medical inspector of the city public schools; died Dec. 16, aged 86, of cardiac decompensation.

Rasck, Alfred Gregor, Ainsworth, Neb.; Loyola University School of Medicine, Chicago, 1916; fellow of the American College of Surgeons; on the staff of Ainsworth Clinic and Hospital; died in St. Joseph Hospital, Omaha, Oct. 16, aged 73, of peritonitis, following gastric resection for bleeding duodenal ulcer.

Ray, Emmett Boyd, Kosciusko, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1935; on the staff of Montfort Jones Memorial Hospital; died Dec. 4, aged 45, of injuries received in an automobile accident.

Ricketts, Henry Ernest, Newark, N. J.; Columbia University College of Physicians and Surgeons, New York City, 1905; an associate member of the American Medical Association; for many years superintendent of the Essex County Isolation Hospital, Belleville; died Dec. 22, aged 78, of coronary thrombosis.

Rimer, Edward Sherrard, Wilton, Conn.; University and Bellevue Hospital Medical College, New York City, 1904; an associate member of the American Medical Association; formerly on the faculty of his alma mater; served during World War I; first deputy health officer at the Quarantine Station on Staten Island, N. Y.; died in the Norwalk (Conn.) Hospital Dec. 19, aged 78, of uremia.

Rothman, Herman Robert ✦ Detroit; George Washington University School of Medicine, Washington, D. C., 1930; member of the American Psychiatric Association; served during World War II; for many years associated with the Veterans Administration; on the staff of the Mount Carmel Mercy Hospital, where he died Oct. 11, aged 50, of cerebral embolism.

Russell, Frank Hamer, Worcester, Mass.; University of Tennessee College of Medicine, Memphis, 1917; died Nov. 20, aged 75, of coronary disease.

Sandler, Morris, Brooklyn, N. Y.; Long Island College Hospital, Brooklyn, 1925; member of the Medical Society of the State of New York; served during World War II; on the staff of the Brooklyn Women's Hospital; died in the Long Island Jewish Hospital Dec. 15, aged 56, of coronary thrombosis.

Schweigert, Edward A., Buffalo; University of Buffalo School of Medicine, 1899; an associate member of the American Medical Association; for many years chief of medicine and since 1955 chief of medicine, emeritus, at the Buffalo Columbus Hospital, where he died Dec. 21, aged 80, of uremia.

Schwenkmeyer, George Frederick, Cincinnati; Medical College of Ohio, Cincinnati, 1896; died Oct. 14, aged 81, of arteriosclerosis.

Seiberth, Jacob ✠ Pixley, Calif.; Medical College of Indiana, Indianapolis, 1904; on the staff of the Tulare (Calif.) County Hospital; died in the Municipal Hospital, Visalia, Dec. 19, aged 81, of cerebral hemorrhage.

Shapiro, George Robert, Brooklyn, N. Y.; Medical College of Virginia, Richmond, 1917; member of the Medical Society of the State of New York; died Oct. 10, aged 63.

Shaw, Norman Dudley ✠ Dearborn, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1916; died Nov. 21, aged 64, of coronary disease.

Sherrard, Milton B. ✠ Long Beach, Calif.; University of Kansas School of Medicine, Kansas City, 1906; formerly practiced in Pocatello, Idaho, where he was director of the Bannock Health Unit; died Dec. 12, aged 75, of coronary disease.

Shivelhood, Elizabeth Kalbach, Philadelphia; Temple University School of Medicine, Philadelphia, 1939; on the staff of the Philadelphia State Hospital; died Dec. 17, aged 43, of cancer.

Siegel, Charles Wulf ✠ Brooklyn; L.R.C.P., Edinburgh, L.R.C.S., Edinburgh, and L.R.F.P.&S., Glasgow, Scotland, 1937; served during World War II; on the staff of the Maimonides Hospital, where he died Dec. 2, aged 45, of a heart attack.

Simpson, Clarence Eugene ✠ Detroit; Detroit College of Medicine, 1903; past-president, trustee, secretary, and delegate of the Wayne County Medical Society; served on the faculty of his alma mater; died Dec. 10, aged 78, of cerebral vascular accident.

Snavely, Marion Elizabeth ✠ West Haven, Conn.; Yale University School of Medicine, New Haven, 1925; served as public health officer; died Dec. 28, aged 59.

Spiceland, Jack Logan, Lucedale, Miss.; University of Tennessee Medical Department, Nashville, 1909; served as mayor of Lucedale; on the staff of the George County Hospital, where he died Dec. 11, aged 69, of carcinoma of the lung.

Stallings, Russell Duke, Atlanta, Ga.; Chattanooga (Tenn.) Medical College, 1893; veteran of the Spanish-American War and World War I; served on the staff of the Veterans Administration Hospital; died Nov. 7, aged 87, of a heart attack.

Stern, Jacob ✠ Chicago; University of Illinois College of Medicine, Chicago, 1916; an associate, International College of Surgeons; served during World War I; for many years on the staff of the South Chicago Community Hospital, where he died Dec. 20, aged 61, of coronary thrombosis.

Stevenson, Ellerslie Wallace, Pittsburgh; Jefferson Medical College of Philadelphia, 1904; an associate member of the American Medical Association; veteran of the Spanish-American War; died Nov. 6, aged 78, of cerebral thrombosis.

Stone, Emil Herman, Cleveland; Harvard Medical School, Boston, 1906; served in France during World War I; served on the staff of the Lakeside Hospital; died Dec. 17, aged 76, of a heart attack.

Stratton, Ralph Ricker ✠ Melrose, Mass.; Harvard Medical School, Boston, 1902; fellow of the American College of Surgeons; past-president of the Middlesex East District Medical Society; served on the staff of the Melrose Hospital, where he died Nov. 27, aged 80, of coronary thrombosis.

Strauss, Alvin Weil ✠ Little Rock, Ark.; Medical Department of Tulane University of Louisiana, New Orleans, 1912; for many years on the faculty of the University of Arkansas School of Medicine; served in France during World War I; member of the staffs of St. Vincent Infirmary, Arkansas Baptist Hospital, and the Arkansas Children's Home and Hospital; died Dec. 17, aged 65, of leukemia.

Stuart, Daniel Delehanty Vincent Jr. ✠ Washington, D. C.; Georgetown University School of Medicine, Washington, D. C., 1908; commissioned assistant surgeon in the U. S. Navy in 1910 and resigned in 1912; served during World War I; formerly on the faculty of his alma mater; for many years on the staffs of the Garfield Memorial, Children's, and Doctors hospitals; died in the Veterans Administration Hospital, Kecoughtan, Va., Nov. 11, aged 70, of intestinal obstruction and coronary heart disease.

Sykes, George Frederick ✠ Cleveland; University of Toronto Faculty of Medicine, Toronto, Canada, 1917; served with the Canadian Army overseas during World War I; for many years medical director of the White Motor Company; died Dec. 5, aged 63.

Tankersley, William ✠ Hope Hull, Ala.; Kentucky University Medical Department, Louisville, 1906; died Dec. 2, aged 81, of pyelonephritis, hypertrophy of the prostate, and arteriosclerosis.

Tharp, Roger Allen, Mansfield, La.; University of Texas School of Medicine, Galveston, 1917; member of the Louisiana State Medical Society; served as director of the DeSoto Parish Health Unit; on the staff of the DeSoto General Hospital; died Oct. 2, aged 65, of coronary thrombosis.

Thompson, Peter Hunter ✠ Boston; Tufts College Medical School, Boston, 1898; Harvard Medical School, Boston, 1901; formerly on the faculty at Harvard Medical School; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; past-president of the New England Ophthalmological Society; on the staffs of the Massachusetts General Hospital and Massachusetts Eye and Ear Infirmary; died Dec. 1, aged 82, of cerebral thrombosis.

Trewhella, Arthur Paul, Jersey City, N. J.; Georgetown University School of Medicine, Washington, D. C., 1929; member of the American Academy of General Practice and the Medical Society of New Jersey; president-elect of the New Jersey Academy of General Practice and vice-president of the Hudson County Medical Society; on the staffs of the Margaret Hague Maternity Hospital and St. Francis Hospital; Hudson County boulevard police department physician; died Nov. 28, aged 49.

Trinder, John Holmes ✠ Lieut. Colonel, U. S. Army, retired, Washington, D. C.; Jefferson Medical College of Philadelphia, 1904; entered the Army in 1912 and retired Oct. 15, 1928; served in France during World War I; fellow of the American College of Surgeons; associate professor of otorhinolaryngology at the Georgetown University School of Medicine; on the courtesy staff of the Doctors and Sibley Memorial hospitals in Washington and the Suburban Hospital in Bethesda, Md.; died Dec. 10, aged 74.

Van Nuys, Walter Crowe ✠ Dayton, Ohio; Rush Medical College, Chicago, 1902; formerly superintendent of the Indiana Village for Epileptics in New Castle, Ind.; died Dec. 5, aged 78, of emphysema and cardiac decompensation.

Van Sickle, Walter Joy, Mora, N. Mex.; Indiana University School of Medicine, Indianapolis, 1944; served as a medical officer in the Medical Corps; interned at the Thomas D. Dee Memorial Hospital in Ogden, Utah; formerly a resident at the Veterans Administration Hospital in Albuquerque, N. Mex.; died Nov. 5, aged 44, of injuries received in an airplane crash.

Waters, Charles Millard, Wilmington, Del.; Hahnemann Medical College and Hospital of Philadelphia, 1934; member of the Medical Society of Delaware; on the staffs of St. Francis and the Memorial hospitals; died Nov. 19, aged 44, of heart disease.

FOREIGN LETTERS

AUSTRIA

Insulin Shock Treatment in Patient with Diabetes.—At the meeting of the Society of Physicians in Vienna on Nov. 11, 1955, Drs. O. H. Arnold and H. Gastager reported on a 27-year-old woman who had acute schizophrenia with catatonic traits and who, in March, 1955, was given electroshock treatment. She had a satisfactory remission, but three weeks later there was a recurrence with an increasingly paranoid tinge. Despite diabetes mellitus of five years' duration, which was difficult to control, 50 insulin shock treatments, each of one hour's duration, were given because of the unfavorable prognosis of the schizophrenic bout. Although diabetes had been considered as absolute contraindication to insulin shock therapy, there were no complications and a complete remission occurred.

Oral Therapy of Diabetes.—At the same meeting, Drs. V. Lachnit and G. Ferstl stated that modern investigations on glucagon, a hormone secreted by the alpha cells of the pancreas, dealt with the possibilities of electively influencing the alpha cells of the pancreas. While in animal experiments cobalt salts and other metals showed severe toxic side-effects in addition to damage inflicted on the alpha cells, which, however, was not always demonstrated, several sulfonamide compounds were observed to have pronounced reducing effect on the blood sugar level. In animal experiments the sulfonamide isopropylthiodiazol proved to have a hypoglycemic effect; the results of these experiments also suggested an influence of the drugs on the alpha cells, but changes in the liver and kidneys were not observed. This drug was given to a series of healthy volunteers and diabetic patients. Blood sugar curves obtained from persons with empty stomachs were reported, as well as the results of dextrose loading tests and of daily blood sugar determinations that clearly revealed the reduction in blood sugar. Epinephrine hyperglycemia, however, could not be suppressed. The excretion of sugar in the urine was often greatly reduced in previously clinically controlled patients with diabetes in whom a balance had been established. Other diabetic patients were therapeutic failures. The drug acts by virtue of damage of alpha cells, by the influence it exerts on enzymatic action, and by the reduced absorption of carbohydrates. An effect via the thyroid was not supported by clinical observations. Since the damage to the alpha cells could not be reproduced in every case, all these views are still hypothetical. No changes were observed in this series of 20 patients with respect to blood cell count and to changes in the urine, serum proteins, and skin. In one patient the result of the sulfobromophthalein test, which had been interpreted as normal before the administration of the drug, became slightly abnormal after its administration. The speakers caution against a general use of substances of this type without clinical control because of their effect on the gastric juice and intestinal flora and because of the undesirable side-effects.

Dr. Nissel reported on a therapeutic trial with acetazolamide, a sulfonamide preparation. Because of its acidosis-eliciting effect the drug was at first not given to diabetic patients with cardiac decompensation, in order to avoid a disturbance of the carbohydrate metabolism. Later, cautious experiments showed that, after the administration of this drug, the excretion of sugar in the urine was diminished. In one patient, on the first day of the administration of acetazolamide, the excretion of sugar in the urine was markedly increased, but afterwards there was a definite reduction, so that it became possible to reduce the dose of insulin. Since January, 1955, dextrose double-loading tests were performed on 25 healthy persons and on 13 patients with controlled diabetes, with and without preceding administration of 500 mg. of acetazolamide two to three hours before the start of the test. In the persons with normal metabolism, results were equivocal. After the administration of the drug, the first culmination point was increased in some persons, while in others the second culmination point was increased, and in still others both the culmination points were increased as compared with loading tests performed without a preceding administration of acetazolamide. Four patients did not show any differences at all. In three patients a plateau-like course with no pronounced culmination point was observed. In eight patients the curve after the administration of the drug was lower than when it was not given and the restoration to normal values was delayed.

Death of Professor Finsterer.—Prof. Hans Finsterer of Vienna died at the age of 78 on Nov. 4, 1955. He received his M.D. degree from the University of Vienna in 1902 and was engaged in private surgical practice until 1935, when he was appointed a member of the executive committee of the surgical department of the Vienna General Hospital. He made valuable contributions to the treatment of bleeding peptic ulcers. The nearly 300 papers he wrote include a monograph on local anesthesia in abdominal surgery and another on carcinoma of the colon. He was a member of the International Society of Anesthesia and the International College of Surgeons.

DENMARK

Cortisone for Arthroses.—Dr. Peter Rasmussen (*Ugeskrift for læger*, Nov. 3, 1955) reports a series of patients treated for arthrosis of the knee or hip with intra-articular injections of 25 or 50 mg. of hydrocortisone and a control series of patients who were given radiological treatment earlier in another hospital. Most of the patients were given ambulatory treatment, and when an injection resulted in freedom from symptoms, it was not repeated till a relapse occurred, but when the benefit was less marked, a second injection was given four days later, and a third after a week. If there was still no effect, one or two injections were given after an interval of a month or two, and if they had no effect, treatment was discontinued. There was never any general reaction to this treatment, and the arthrosis seemed to be made worse in only one patient. When the disease of the knee was slight, a good effect was obtained by hydrocortisone treatment in 90% of the patients and by radiological treatment in 75%, but when the disease was more severe, the relatively slight effects of treatment were about the same with either treatment. In another article in the same issue Andersson and Buttenschön state that good effects were obtained in 63 patients by the use of this treatment, complete freedom from symptoms being achieved in 14 patients and marked improvement in 42. The duration of the remissions lasted from two days to more than three months. In most patients the remissions lasted longer after several courses of this treatment had been given, but a few patients suddenly found the treatment no longer effective after it had been helpful for a time. The general impression from this study is that intra-articular injections of hydrocortisone constitute a valuable supplement to earlier methods of treatment, possessing the advantages conferred by economy of time and simplicity of administration.

Care of the Feeble-Minded.—On Nov. 15, 1855, the first institution for the care of the feeble-minded was opened, with Dr. Jens Rasmussen Hübertz as its first director. Since then great advances have been made in the care of the feeble-minded, who in Denmark include between 1 and 1.5% of the population. The actual number of feeble-minded persons registered as such and more or less under the supervision of the public authorities is about 16,000. About half this number is accommodated in institutions for the feeble-minded, and the rest are cared for in private homes. Some of the latter are on waiting lists pending their admission to an institution. The centenary of the inauguration of public care of the feeble-minded is celebrated in the Nov. 10 issue of

The items in these letters are contributed by regular correspondents in the various foreign countries.

Ugeskrift for læger. In one of the articles on the subject, Dr. E. S. Jensen states that 51 patients were given 0.25 or 0.50 mg. of reserpine by mouth three times a day at first, with a gradual rise to 2 mg. three times daily. In many patients the good effects became evident only after the drug had been given for a month or two. On the discontinuation of the drug, its good effects seemed to last two or three weeks. Such effects were observed in about half the patients treated. In another article, Dr. Jensen gives an account of a follow-up study of mental defectives whose improvement under institutional treatment had led to their discharge. The many persons in this group who fell into the hands of the police or got into other trouble illustrated the need for after-care.

Consumption of Tobacco.—The Danish National Morbidity Survey of 1950 reported the questioning of 100,000 adults with regard to their health in the month immediately prior to the interview. In the nine months from August, 1952, to April, 1953, the interviewers sought information concerning tobacco consumption, and in the last four months of this survey, January to April, 1954, subjects were asked whether they had reduced the amount of their smoking since the public debate on tobacco and pulmonary cancer. In the *Danish Medical Bulletin* for December, 1955, Hamtoft and Lindhardt summarized the findings. In contrast to the Anglo-Saxon populations, who prefer cigarette and pipe smoking, the Danes favor cigar and cigarillo smoking. In the present report, a heavy smoker is defined as one who uses daily at least four cigars, seven cigarillos, or more than 25 gm. of smoking tobacco. Between August, 1952, and April, 1953, 77.8% of the men and 39.9% of the women were found to be smokers. Between January, 1954, and April, 1954, although there was practically no reduction in the number of smokers in response to the cancer scare, there was a slight but quite unmistakable decline in cigarette smoking among the men, with a change to pipe and cigarillo smoking. Women, too, smoked fewer cigarettes and more cigarillos. This change was particularly noticeable among light smokers, as compared with heavy smokers.

NORWAY

Mass BCG Vaccination.—At successive meetings of the Norwegian Medical Society in Oslo towards the end of 1955, the merits of BCG vaccination, which has been rendered compulsory in Norway, were debated. In challenging the justification for further mass BCG vaccination, Dr. Gedde-Dahl was not inclined to credit BCG with any appreciable part of the recent decline in tuberculosis rates. He noted that this decline was equally noticeable in countries where BCG vaccination was not used. He argued that the efficacy of mass BCG vaccination is largely impaired by variations in the quality of the vaccine, which cannot easily be standardized. In the absence of BCG vaccination, a positive tuberculin reaction is informative in that it discloses infection with tuberculosis; whereas, in a BCG-vaccinated community it is difficult to distinguish between the tuberculin response to it and to natural infection. With mass BCG vaccination discarded, the finding of a positive tuberculin test would be the signal for appropriate action and exploitation of the great advances in treatment. Defending BCG vaccination, Prof. Axel Ström produced figures to show how important a part it plays in the country's fighting services. Dr. Galtung Hansen of the National Tuberculosis Service and Dr. Eyolf Dahl of the Oslo Tuberculosis Service produced statistical evidence to show that BCG vaccination has made an important contribution to the decline of tuberculosis. Dr. Evang of the Norwegian Public Health Service, who is responsible for the present BCG campaign, maintained that neither the epidemiological or the therapeutic situation nor the attitude of the public rendered it desirable or necessary to discontinue mass BCG vaccination. Other speakers, including Dr. Heimbeck, who originally introduced BCG vaccination into Norway, were less in favor of it on wholesale lines, whatever their appreciation of it under special conditions. In his final reply, Dr. Gedde-Dahl noted that there also is now a tendency in Sweden to discontinue wholesale BCG vaccination and to reserve it for special situations.

Seventy-Five Year Jubilee of Journal.—In January, 1881, three physicians of Kristiania, as Oslo was then called, started a new medical journal. Five years later, when the Norwegian Medical Association was founded, the owners of this journal offered it as a gift to the association on the understanding that any change made should not conflict with the ethical and scientific standards already established. Since then, *Tidsskrift for den norske laegeforening*, to give it its full title, has faithfully reflected the advances made in medicine. The 75-year jubilee number includes the portraits of such distinguished Norwegian medical men as Francis Harbitz, Carl Miller, and Johan Holst. Thumbnail sketches tell the reader how each of Norway's medical pioneers made his most important contribution. The relative obscurity of Norwegian medical literature has permitted some brilliant Norwegian work to become eclipsed. As an example, Dr. Lucien Dedichen in 1914 described what 18 years later came to be known as Cushing's syndrome. Several pages of this jubilee number are devoted to summaries in English of the most important articles in it. There is also an article in English on the influence of Norwegian medicine in the United States, written by Dr. Gunnar Gundersen of La Crosse, Wis.

SWITZERLAND

Malaria Eradication in Southeastern Europe.—A conference held in December in Belgrade, sponsored by the Yugoslav government and the regional office for Europe of the World Health Organization, opened the way to closer cooperation between countries in southeastern Europe for purposes of malaria eradication. Agreements on malaria control already exist between Bulgaria and Romania and between Greece and Turkey, and an agreement on communicable diseases in general exists between Bulgaria and Yugoslavia. The conference recommended, among other things, that, through bilateral agreements, a rapid exchange of accurate information on malarial conditions along common boundaries and on eradication methods should be established. In the participating countries, DDT-resistant mosquitoes have so far been discovered only in Greece. Uniform resistance tests should be adopted and research actively pursued, so that appropriate action can rapidly be taken should resistant mosquitoes make their appearance in any of the other countries. In Albania up to 1933 and in Bulgaria up to 1930, about 500,000 cases of malaria were reported annually, but during the first 10 months of 1955, only 1,221 cases were reported in Albania, and only 652 in Bulgaria. The number of cases in Greece dropped from 1,200,000 annually before World War II to 408 in 1952. Romania in 1948 had 338,198 cases, but in the first 10 months of 1955 there were only 325. In Turkey, 8.6% of the hospital patients had malaria in 1940, but in 1954 the proportion was only 0.6%. Yugoslavia, with about a million cases in 1935, had only 796 in 1953. Taking the area as a whole, malaria, which formerly attacked 4 to 5 million persons a year, now affects only a few thousand, and there are few deaths.

Rabies Control.—The *Bulletin of the World Health Organization* (vol. 13, no. 5) reports the results of a treatment for persons exposed to rabies. It combines the traditional vaccine treatment with a hyperimmune antirabies serum. It has given excellent results in the treatment of people severely bitten about the head and face by rabid animals. While hyperimmune antirabies serum was developed soon after Pasteur's vaccine, it had been used only on a limited scale. The serum appears to check the disease until the vaccine can begin to work. This statement is based on the results of a field trial carried out in Iran by Dr. M. Baltazard and his co-workers of the Institute Pasteur at Teheran. In the past 15 years among persons bitten by rabid wolves treated with vaccine alone at the Institute Pasteur, about 40% of those whose wound involved the head died of rabies. In August, 1954, a rabid wolf attacked 29 people in the same village. They were successfully treated at Teheran, even though 18 of them suffered severe head wounds.

Review of Heart Operations.—The development of the congenital heart disease centers in Vienna (Austria) and Zagreb (Yugoslavia) since the visit of the expert team of the World Health Organization in 1950 has been reviewed by WHO. In

Vienna, 150 children with congenital heart malformations including 82 blue babies have been operated on (with only four deaths), and 80 operations on adults have been performed. In Zagreb, about 500 children have been examined. Since 1951, 80 cardiac operations have been performed on children (with four deaths) and 67 on adults (with three deaths). At present, about 100 patients are treated annually in Zagreb and 30 to 40 children are treated annually in Vienna.

UNITED KINGDOM

Annual Report of Ministry of Health.—According to the Report of the Ministry of Health for the Year Ended Dec. 31, 1954: Pt. 11. On the State of the Public Health (Her Majesty's Stat. Off.) the birth rate was 15.2 per 1,000 population (15.5 in 1953) and the death rate 11.3 (11.4 in 1953). Infant mortality reached the lowest level ever reported (25.4 per 1,000 live births). This is lower than the rate in the U. S. (27), Scotland (31), Northern Ireland (33), and Ireland (38) but higher than the rate in Sweden (19), Canada and the Netherlands (21), and Australia and New Zealand (22). The neonatal death rate (deaths within the first month of life) remained unchanged. Of the 45,118 premature babies born, 8.4% did not live more than 24 hours. The expectation of life at birth is 68 years for boys and 73 for girls. There was another increase in the death rate from cancer, particularly in men over the age of 55. There were 16,331 deaths from cancer of the lung (an increase of 1,199); of these 13,995 were men.

Food poisoning showed an increase of 14% over 1953. The made-up meat dish was considered to be the principal source of infection. Preventive measures have so far proved ineffective. Among the organisms responsible were Salmonella (13%), Micrococcus (31%), and Clostridium (15%). Rapid cooling followed by refrigeration of meat dishes would practically eliminate poisoning with Clostridium. Micrococcic food poisoning would be largely prevented by attending to minor lesions of the hands of those handling cooked meat dishes and by the use of a "no-touch" technique, but food manufacturers and caterers find it difficult to apply these simple remedies.

Studies on the fluoridation of water supplies were made during the year. In Slough, where the water naturally contains 0.9 parts of fluoride per million, 30% of school children between the ages of 11 and 16 living in the area since birth were free from dental caries. Others not born there but moving into the area subsequently did not have such a good record, only 12% being free from caries. Mottling of the enamel, due to fluorides, occurred in only 1% of the native children. Although freedom from food rationing permitted wider choice of foods, alarm was expressed at the increase in the consumption of sugar and fats at the expense of protective and tissue-building foods. Although this might not affect adults, it might be harmful to growing children. The situation will be carefully watched in the future.

The report mentions the extravagant use of blood in the hospitals. This is attributed to failure to appreciate the limitations of blood transfusion and lack of knowledge of the clearly defined indications for its use; 24.5 bottles of blood are used for every bottle of plasma. More use should be made of dried plasma, so that patients really needing blood are not deprived of it. The report also points out that of 127,000 prescriptions filled, 17% were for cough mixtures, 10% for laxatives, and 11% for external applications. Before the advent of the health service such items were commonly paid for by the patients, who bought them without a prescription.

The death rate from tuberculosis has fallen by 64% in the past six years, but the morbidity rate for pulmonary tuberculosis has decreased by only 14%. The morbidity rate for nonpulmonary tuberculosis has decreased 50% in two years. The number of contacts examined continues to increase, but only 2% of new cases are discovered this way. There were no reported cases of smallpox, but there is concern over the low rate of vaccination in infants. For adequate protection a 75% vaccination rate should be maintained; it is only 34.5% for the whole of England and Wales. Diphtheria claimed only nine deaths, none of which were in children immunized within five years of contracting the disease. Estimates of the proportion of children under 5 years of age who are protected against diphtheria are: under 1 year, 37%; 1 to 2 years, 56%; 3 to 4 years, 70%; and 4 to 5 years, 63%. In contrast to typhoid fever, which has now ceased to be a public health problem, dysentery showed an alarming increase: 31,858 cases were reported, or 50% more than in 1953. Only 0.1% of the cases reported were fatal. Nearly 75% of the cases reported were in children under 15. Infection was transmitted largely from person to person and not by contaminated food. The importance of washing the hands after visiting the toilet is emphasized. There were more deaths from accidents, duodenal and gastric ulcers, and suicide in 1954 than in 1953. Deaths from anesthetics have been increasing since 1938, particularly in persons over the age of 65. A possible explanation of this is that more operations are being performed than formerly on older people and that the scope of surgery is much greater and includes more poor surgical risks than formerly.

Symposium on Cancer.—The Royal College of Surgeons held a symposium on cancer in December. Prof. Geoffrey Hadfield stated that hormone dependence may occur in any organ in which normal growth, development, and function are conditioned by a specific hormone or hormones acting synergistically. The hormones to which breast growth may be subject are the ovarian estrogens, the adrenal estrogens, the adrenal steroids, and those from the pituitary. Prolactin, progesterone, and estrone are synergists responsible for normal duct, alveolar, and lobular development. Prolactin is important because it is probably identical with urinary mammotropin excreted by patients with breast carcinoma. Alone it is responsible for the maintenance of breast structure. Prof. Ian Aird, of the Postgraduate Medical School, London, said that too much emphasis was given to technical operative details and there was a competitive desire among surgeons to produce ever better five-year results, which are sometimes misleading. There is no certain cure of cancer by radiotherapy or by chemotherapy. Surgery gives the only hope of cure if performed early. Radiotherapy in the treatment of carcinoma of the tongue gives fairly good results, but recurrence is always possible. There is little to be gained in the operative treatment of cancer of the breast by wider excisions designed to increase the number of five-year survivors if thereby the operative mortality and disability in survivors are increased. Professor Aird praised the trend toward lobectomy in place of pneumonectomy for the treatment of bronchial carcinoma. In patients with carcinoma of the stomach only a third are operated on; in only a third of these is resection possible; and only a third of these survive for five years. This amounts to a 3% cure. With such poor prospects it is wrong to perform total gastrectomy routinely. Total pancreatectomy for carcinoma of the pancreas does little for the average patient, whereas palliative operations often result in longer survival.

Sir Stanford Cade, of Westminster Hospital, London, said that cancer, like diabetes, rheumatism, epilepsy, and heart disease, can be controlled rather than cured by treatment. Palliative treatment of cancer controls signs and symptoms and permits return to a near-normal life. Surgery in the so-called inoperable case should be used in concert with radiotherapy, chemotherapy, and hormonotherapy. Hormonotherapy alters the internal environment of the growth. In Sweden, where cancer is reportable, 80% of the patients cannot be controlled or cured by surgery alone. In England and Wales 80,000 die each year from cancer, and for every death three patients remain alive with their growth. Thanks to supervoltage roentgen rays from a linear accelerator and to radioactive cobalt, "inoperable" as applied to cancer no longer means without hope. Dr. D. French, a general practitioner, said that the patient who constantly visits the physician's office with trivial complaints is his own worst enemy because his slowly appearing symptoms of a neoplasm are often overlooked. A negative report from a specialist should always be accepted with reservations; it means that a lesion has not been found, not that one is not there. Patients generally pass through moods of optimism, doubt, and then resignment. The time to tell them the truth is when optimism becomes doubt.

Daily Visiting in Children's Hospitals.—Illingworth and Holt of the Sheffield Hospital reported that until recently daily visits by parents have not been encouraged in British hospitals for children (*Lancet* **2**:1257, 1955). The parents of the 181 children studied made about 91% of the maximum possible number of visits. The important fact that this study brought out was the remarkable faithfulness of parents in visiting their sick children whenever they could, however costly it was in time and money. The average traveling time was 1¾ hours and the cost 30 cents. Of visits requiring four hours or more in traveling time, 77% of all possible visits were made, and of those costing 70 cents or more, 74% were made. The study also brought out the frequency with which children of all ages, but particularly young children, showed emotional disturbances when separated from their parents. Visits by mothers were over twice as frequent as by fathers. The authors believe that children should not be taken into a hospital unless it is absolutely necessary. If they are, they should be told that they are going to be admitted and should be given some idea of what is to be done. A hospital in California issues a little booklet with illustrations to give the child some idea of what the hospital will be like. Every hospital with a children's ward should have accommodation for the mother, who, if possible, should live in with her child if it is very young. If she cannot do this the next best thing is to spend as much of the day as possible with her child, nursing him or giving him his meals, attending to his toilet, and helping in other ways. Daily visits by the mother help to preserve the mother-child relationship. It is far better for the child to see his mother every day, even though he will be upset when she leaves, than to allow him to think that she has deserted him, or to forget her altogether. It is important to do everything possible to reduce psychological trauma to the hospitalized child. Hospital design and decoration should be directed to this end. Cubicles, although bacteriologically sound, make the child think that he is in solitary confinement. Ideally a child who is not too ill should have access to a playroom attached to the ward. At the Sheffield Hospital the mother is encouraged to be present when the child awakens after an anesthetic, and she is given a leaflet telling her the part she can play in both the physical and psychological care of her child. Nurses and students are also instructed on the psychology of child care and are shown a film, "A Two-Year-Old Goes to Hospital."

Compensation for Hysteria.—A judge, in awarding $14,800 damages for injuries arising from a railway accident, delivered a judgment that was of medicolegal interest in regard to compensation neurosis. The plaintiff, who sued the British Transport Commission, stated that he was thrown to the floor and pinned by the legs when the train in which he was traveling collided with another train. His case against the commission was that as a result of his experiences in the railway crash he suffered from loss of memory, loss of power in the legs, and traumatic neurosis due to shock. The defendants claimed that the plaintiff was suffering from an incipient neurosis at the time of the accident, that his symptoms resulted from this neurosis and his psychological make-up, and that a desire to get compensation prolonged his symptoms, which were hysterical. The judge said that the plaintiff suffered from hysteria from the time of the accident, or shortly afterward. This manifested itself as a disturbance of gait and stance and up to the time of trial had prevented his working in any capacity. The judge was satisfied that the symptoms were genuine and that the plaintiff suffered from a true neurosis. He, the judge, was faced with the difficulty of deciding how long it was going to last, because the extent of the damages would depend on this. He accepted the view that hysteria was a motivated, purposive illness, but compensation was not always the motive, and without psychiatric aid it was impossible to find the exact motive in this case. The judge was not satisfied that compensation was the dominant motive in the hysteria of the plaintiff. The opinion of the physician who had seen him was that the duration of his symptoms was indeterminate. He was satisfied that the plaintiff could not work for some time. The dilemma the judge found himself in was that, if the plaintiff never improved, the damages he was awarding would be inadequate, whereas, if he made a rapid and spectacular recovery, they might be too much. How anyone could escape from this dilemma was beyond his comprehension. A stay of execution for 28 days pending appeal was allowed.

Primary Myxedema from Postpartum Shock.—Fraser and Garrod in the *British Medical Journal* (**2**:1484, 1955) report that four patients had obvious myxedema after postpartum shock, due to primary and irreversible thyroid failure. The condition was fully corrected by thyroid hormone alone. The diagnosis was established by a careful assessment of anterior pituitary function and by radioiodine tests after injections of thyrotropin. If the condition were a primary atrophy of the thyroid gland, postpartum shock or hemorrhage could have affected only the thyrotropin secretion of the pituitary, since the adrenal, gonadal, and lactation functions were still intact. Hypopituitarism is a well-known and important sequel of severe postpartum hemorrhage, but all pituitary functions have been affected in the patients hitherto reported. The myxedema was believed to be due to primary thyroid failure because: (1) the thyroid failure proved to be irreversible at an early stage of the disease; (2) after treatment with thyroid hormone there was no evidence of hypopituitarism; and (3) thyroid hormone alone fully corrected the condition.

Ban on Heroin Lifted.—The ban on the manufacture and export of heroin imposed by the government in February, 1955, has been lifted. Medical opinion was divided on the matter. Lord Jowitt, an eminent lawyer, pointed out in the House of Lords that legally the ban could not be imposed. He said that the central health services committee, which recommended the ban, was the wrong body to consult. Also, the Minister of Health propounded the wrong question. The question that should have been put was: Is there or is there not in all cases an adequate substitute for heroin? The question put was: Do you concur with the government's resolution to ban heroin? This question was partly medical and partly political. Lord Jowett said further that to refuse to license anybody to manufacture heroin was beyond the Home Secretary's powers. In his view the banning of heroin could be done only by an act of Parliament and not by a subterfuge, invoking the Dangerous Drugs Act. All 12 of the London teaching hospitals were against the ban.

Drip Indicator.—A drip indicator, enabling a night nurse in a darkened ward to tell at a glance from anywhere in the ward without interrupting her other duties when the drip is running out, has been designed by Dr. Evans, of St. Bartholomew's Hospital, London, and Dr. Zuck, of Chase Farm Hospital, Enfield. The lighting unit is powered by a high-tension battery and uses neon bulbs. A spring-loaded switch illuminates a steady warning light when the weight of the bottle holding the transfusion falls to a predetermined level, or the device can be adapted for use with a buzzer.

Shortage of Private Beds.—The shortage of private beds in nursing homes and hospitals was discussed at a meeting of the private practice committee of the British Medical Association. Dr. John Hunt said that this shortage had led to the formation of a nonprofit body for the purpose of bringing about a closer integration of existing facilities, of exploring the possibility of making more private beds available, and of giving advice and help to nursing homes. The National Health Service was not intended to exclude such facilities, but the shortage of such accommodations is becoming manifest.

Dial "DOC."—A member of the House of Commons asked the Postmaster-General, who is responsible for the telephone system, whether he would consider setting up a system whereby members of the public could contact a physician in emergency by such a method as dialing "DOC" or some such easy code letters. The Postmaster-General said such an idea would be practicable if physicians in a given area arranged a central point to which calls could be made. If this were done his department would cooperate, although a number of technical problems would have to be resolved.

CORRESPONDENCE

FOREIGN MEDICAL MISSIONS

To the Editor:—Many members of the medical profession will be glad to learn of the establishment of a community especially devoted to the medical interests of the mission countries. The Sons of Mary, Health of the Sick, established by me with the kind authorization of His Excellency Richard J. Cushing, D.D., Archbishop of Boston, offers unique opportunities to doctors who have a missionary vocation. The special purpose of the community is to prepare persons to work in mission lands and districts by training natives to be nurses, and it is hoped afterward to train doctors. These natives will then be sent out in organized groups under a head nurse to work from a common center in the towns and villages, bringing to the people the advantages of the discoveries of modern medicine. They will also teach the principles of hygiene and sanitation and train capable natives in first-aid work in their own locality. It is hoped to keep the standard of training at a high level, adapted to the particular needs of the native populations. The good will secured by these works of charity will, it is hoped, also greatly help to improve the moral and religious status of the natives, often at a low ebb, and, by both these means, save the people from the delusions of communistic propaganda that flourishes from the physical and moral misery of the underprivileged peoples. Men with medical training, or who are competent as technicians or nurses, are especially welcome in this community, and it will be a pleasure to send anyone who wishes further information a booklet and leaflet giving more details of its purpose and plans. Already several doctors have applied for admission to the community. This is the only religious community in the world, so far as is known, that was established for the primary purpose of the medical and nursing training of the native peoples. Women doctors, nurses, and technicians can find similar opportunities in the other community founded by me, the Daughters of Mary, Health of the Sick. Immense numbers of children and often their mothers are dying for want of knowledge of hygiene on the part of the mothers. The number of other preventable deaths is also great. The vastness of the need and the urgency of bringing help to the afflicted and suffering in mission districts make it essential to train the natives to help their own people, as it seems quite impossible to recruit enough workers from the United States or elsewhere to meet the pressing and ever-growing needs in the mission districts.

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DRUGS AND ELECTROCONVULSIVE THERAPY

To the Editor:—In THE JOURNAL, Dec. 17, 1955, page 1520, a timely article appeared by M. W. Foster Jr. and R. F. Gale Jr. from the Medical College of Virginia. It warned of the dangers of combining reserpine with electroconvulsive therapy. These authors reported one death and three near deaths in a series of 63 cases. In view of the extensive literature that has recently arisen in favor of the use of this drug in certain psychiatric conditions, it becomes imperative to compare experiences and keep the profession advised of any undue hazards. I wish to report the following case of a near death that was observed in our hospital in connection with the combined use of reserpine and electroconvulsive therapy.

This is the case of a 28-year-old female admitted for the treatment of a pseudoneurotic type of schizophrenia. She was subject to frequent intermittent periods of acute depression, with agitation, anxiety, and suicidal impulses. At these times she had ideas of depersonalization and was suspicious and hostile. She had previously had prolonged psychoanalytic therapy without results, and it was decided to give her electroconvulsive therapy. After administering six treatments, she became more disturbed and actively suicidal, and for four days thereafter she was given 200 mg. of chlorpromazine (Thorazine) daily by mouth. During these four days she received three additional electroconvulsive treatments, without any change in her mental state. Therapy with chlorpromazine was then discontinued, and she was given injections of reserpine (Serpasil) in 2.5 mg. doses. Her first injection of reserpine given was at 5 p. m. on the day of discontinuance of chlorpromazine therapy. The second injection was at 9 a. m. the following morning. Two hours after this second injection she received an electroconvulsive treatment without any untoward effect. The same afternoon she received her third injection of reserpine; the next day she received two additional injections of reserpine—making a total of 12.5 mg. injected in three days. On the following morning she received 1 mg. of reserpine by mouth and an hour later an electroconvulsive treatment was administered. After the usual convulsion, which lasted about 40 seconds, the patient failed to respond in the expected manner. Respirations did not return, and the heartbeat was apparently arrested. Artificial respiration was administered, and the usual stimulation was promptly administered by injection. The patient did not respond, and her muscles and jaw became flaccid and her entire body color became deeply cyanotic. The members of the staff who were on hand all felt that death had ensued, but after about three minutes there was a slight respiratory movement and the pulse returned. After having given over 30,000 electroconvulsive treatments at our hospital and having encountered every form of complication, we found this patient nearer death than any we had ever seen. After recovery she remained confused, incontinent, and disoriented for five days. Needless to say, at this point electroconvulsive treatments were interrupted. After two weeks, they were recommenced but not in conjunction with use of reserpine. The patient received a short series of additional treatments, all without any undue effects, and her mental condition became much improved.

It should thus be noted that after two injections of 2.5 mg. each of reserpine, an electroconvulsive treatment was administered without effect. However, after 12.5 mg. was administered in a space of three days, near fatality resulted. It might be added that previously a number of patients who were receiving reserpine by mouth had been given electroconvulsive therapy, and it was the general feeling of our staff that we were encountering unusual breathing and cardiac difficulties after the convulsion. We did not at that time, however, associate these reactions with the fact that the patients received reserpine concurrently. Since we have inaugurated a rule never to give electroconvulsive therapy to a patient who has had reserpine within the previous three days, we have ceased having these difficulties. I might also add that, on a number of occasions, we have encountered severe cardiorespiratory difficulties with electroconvulsive therapy in patients who were simultaneously receiving chlorpromazine. We are also in receipt of three personal communications from other clinics of deaths that occurred after electroconvulsive therapy that was administered to patients under treatment with chlorpromazine. At our hospital therefore, we have included chlorpromazine and reserpine in the list of drugs not to be administered within three days prior to electroconvulsive therapy.

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EVALUATING A MEDICOLEGAL OFFICE

To the Editor:—In the Correspondence section of THE JOURNAL, Nov. 26, 1955, is a letter by Dr. J. W. Spelman, from the office of the Vermont state pathologist, wherein he comments on my article that appeared in the Aug. 27, 1955, issue. He points out that in the article I have quoted several authorities who believe that 20% of all cases coming into a medicolegal officer's jurisdiction require autopsy. "This," he says, "is greatly different from 100%" that I recommended in the article. In his next sentence he goes on to say, "While autopsies in as many as 50% may be desirable in urban areas. . . ." I cannot resist observing that the 50% that Dr. Spelman recommends also is vastly different than the 20% others have recommended. It would be interesting to know how he arrived at the 50% figure. Moreover, the article points out that a study indicated 80% as medicolegally adequate and that 100% represented the ultimate

in scientific accuracy. The only probable difference between his 50% and my 80% is that mine was arrived at after doing autopsies on all coroner's cases, thus being able to see what we would have missed had we abided by the off-hand opinion, or sheer speculation, of the several authorities who themselves can never know what they miss until, for a given period, they perform autopsies on all their cases. How Dr. Spelman can conclude that 50% is proper but 80% or 100% is not is difficult to comprehend without his having made an actual study. He does not indicate that he has done so. Dr. Spelman's letter suggests that his definition of autopsy may vary from mine, and he implies that I may be calling a mere view of a body an autopsy. He states that, "To my mind, an autopsy is not merely an examination of the external appearance of the body, nor minor procedures such as obtaining a sample of body fluid. . . ." In the article it is quite clear that an autopsy was performed by a board-eligible or certified pathologist for each of the cases reported, and Dr. Spelman appears to overlook this fact. Of the autopsies reported in the article, as for all our autopsies, each includes examination of chest and abdominal cavities, with sectioning and description of all organs. As a further check, specimens of the essential pathology are sent to a second pathologist for gross and microscopic examination and concurrence of opinion. Brain sections are made in 50% of all autopsies. While many take great pride that when they make a postmortem examination they do a most complete one, thus expressing their medicolegal thoroughness, in my opinion, this actually reflects shortsightedness. These men could manage a far greater number of autopsy examinations, without added expense to the community (which they present as an important reason for fewer autopsies), by apportioning their efforts in a rational and reasonable manner. If a person is found dead in bed and at autopsy, after the chest and abdomen are opened, the deceased is found to have a hemopericardium overlying a necrotic myocardium directly related to an occluded coronary and there is a rupture of this necrotic myocardium, it is not necessary to continue by opening the head, in the hope of uncovering a violent death due to head injury, or to take samples of urine or hair. Medicolegally, the time would be far better spent on an autopsy of another body to find the true cause of death. Dr. Spelman asks, "Is it in the public's interest to go to the expense of performing autopsies in all cases of suicidal death, especially when the fact of suicide is well documented with an obvious cause of death and a bona fide suicide note?" The only thing well documented at a suicide is the fact that someone died. How he died deserves careful consideration. That there is a bottle of nembutal beside the bed does not prove this medicament was taken by the deceased. That the person is hanging does not prove he inflicted it upon himself. That his hand is wrapped about the grip of a gun does not prove that he held the gun when fired. Moreover, bona fide notes of which Dr. Spelman speaks, are not only infrequent, they are a rarity. About one-half leave no notes. Of those that do, many are illegible due to stuporous condition or shaky hand. Many more are typewritten and unsigned. In 90% of the notes that are signed, a bank would not cash a 5-cent check on the signature. A large proportion of suicide notes are signed with initials, nicknames, or diminutive terms. Dr. Spelman shows concern over "the expenditure of a great deal more public funds." It would appear that the first concern should be to advise the public, after an objective inquiry, on what medicolegal services they require in the best public interest. Thereafter, he will soon enough know whether they want to spend the money. We should adhere to our roles as medicolegal advisers on the public's need and let the controller or budgeting agencies tell us what the public can afford. That they cannot or will not spend the money does not lessen the need one iota, nor does it lessen the medicolegal officer's responsibility to continue to affirm the need. Thereafter, with sufficient courage, and the determination to adhere to his principles, the medicolegal officer will lead the public to provide the funds for such standards as were recommended and are presently being attained in many California jurisdictions.

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San Francisco 11.

DISCOVERIES BY MEDICAL STUDENTS

To the Editor:—In THE JOURNAL, Nov. 19, 1955, page 1214, the editorial "Medical Students as Scientific Discoverers" omitted several observers included in Victor Robinson's foreword to "Musical Sons of Aesculapius," by Dr. Willard Marmelszadt (New York, Froben Press, 1946). Robinson mentioned that Lorenzo Bellini was 19 when he published his discovery (1662) of the kidney tubules, or ducts of Bellini; Adolph Wendt, in Purkinje's laboratory, discovered (1833) the sweat glands of the human skin; and Thomas Huxley, while a student at Charing Cross Hospital, at age 19, discovered (1845) the layer of cells or membrane in the root sheath of human hair, which bears his name. Robinson suggests that those interested in discoveries by medical students should consult "Eminent Undergraduate Observers," by David Fraser Harris (*Med. Life* **32:**111, 1925) and the introduction, by Hyman Morrison, in the English translation of Paul Langerhans' "Contributions to the Microscopic Anatomy of the Pancreas" (Baltimore, Johns Hopkins Press, 1937). Robinson states that in recent decades medical students have had to become conformists and there has been less opportunity for originality, but their observations have sometimes been useful. Charles Herbert Best, at the threshold of his medical studies in Toronto, Canada, collaborated in research that brought new hope of life for the diabetic patient—insulin (1921). J. Bailey Carter, at the age of 22, with Dr. Arno B. Luckhardt, department of physiology of the University of Chicago, became the co-discoverer of the most important of the newer anesthetics—ethylene (Physiologic Effects of Ethylene, *J. A. M. A.* **80:**765 [March 17] 1923).

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BUSINESS PRACTICE

The American Medical Association and the Sears-Roebuck Foundation cooperatively have prepared a brochure entitled "A Planning Guide for Establishing Medical Practice Units." This publication contains practical suggestions on various phases of planning from selection of a site to arrangement of equipment and is available in the libraries of state and county medical society offices. From time to time parts of the brochure, slightly modified editorially, will be reproduced in the Business Practice section of THE JOURNAL.—ED.

THE BUILDING

ACCESS AND EGRESS

The property and the building should be easily seen by approaching patients. Drive entrances should be wide enough and properly curved so that cars can enter and leave without disturbing normal street traffic. If the building is set back from the street, a second walk from the drive should be provided for those patients arriving on foot. The walk should have easy slopes and a minimum of steps, if any are required. Service traffic, that is, delivery of such things as laundry and fuel, is best arranged where it does not conflict with patient traffic and parking. A separate drive is unnecessary, but there should be space available at the building, so that trucks do not block the drive while making deliveries.

LANDSCAPING

Landscaping is an important item that is often neglected. Actually, landscaping has great influence on the atmosphere of any facility and on the morale of all who use it. Architecturally, landscaping softens sharp building lines and molds the structure to the ground, which helps to make it more than an impersonal shell for its activities. Plants, trees, flowers, and shrubs create a pleasant atmosphere and help patients relax. The public and

the immediate neighbors also appreciate any efforts made toward beautifying the area, and as a result they are more apt to speak favorably of the facility.

In addition to the psychological effects of landscaping, there are also climatic benefits to be gained. Well-placed shade trees can be worth another half-ton of refrigeration in summer, and a line of firs can be worth a sizable fuel saving in winter. Landscaping also makes a valuable screen for protection from noise and unsightly views. Neighbors seldom complain about a parking lot in their midst if they are protected by planting of some thick bushes or a hedge. If a neighbor has an unsightly lot and cannot be prevailed upon to improve it, plant a screen and provide some flowers or flowering shrubs. If the noise from a busy highway proves an annoyance, it can be muffled to a great extent by dense planting between the building and the street.

NEW VERSUS REMODELED

Building a new structure allows you to plan the type of facility you want and place it where you want it on the site to best advantage. Only your pocketbook limits the results. If you know what you want and how you want it, and if the money is available, it is well to build, for a new building has positive advantages in the freedom of arrangement and decoration and can be built to require a minimum of maintenance. It is also a tangible investment that, when properly managed, will return monetary rewards as well as provide operational efficiency and proprietary satisfaction.

If you are not sure of what you want, or how you want it, or if money is a problem, remodeling will often be the quickest, easiest, and least expensive way to house a new medical-practice facility. Store buildings and large residences will often provide an opportunity in a good location with a comparatively small original investment. However, you must keep your eyes open when inspecting the place for structural faults.

When looking over an existing building, consider the structural condition—sagging floors, badly cracked plaster. You can check quickly for signs of leaks that indicate structural conditions needing repair. If remodeling is going to mean extensive rearrangement of the existing partitions, then it should be determined which partitions are supporting the other floors or the roof. The floor framing should be checked to find out if additional load can be carried without sagging. If there are many serious structural faults or signs of extensive decay or termite damage, the building should be disregarded when considering the property value. The cost of making a building sound can often be as much or more than its purchase price.

Advice from an architect or builder will help in avoiding the pitfalls that can arise from remodeling. If a building is sound structurally, then consider its space arrangement in relation to its anticipated use. Can all the elements you want in your office be fitted in a workable manner into this building? Will extensive partition changes have to be made rather than merely adding a few new partitions? It is wise to make a rough plan of the existing structure and then try to fit your office to that plan. Also keep in mind that assistance in planning will usually save far more than it costs.

After you have checked these factors—structure and space—consider some of the details such as the heating, plumbing, and electrical systems—in other words, the utility capacity as a whole. Try to find out what required changes are necessary to result in a workable building.

Only after a full consideration of all factors and an estimate of probable costs (and remember, unit costs on remodeling always run higher than the same work done in a new building) can you determine the feasibility of remodeling. Some buildings will require little more than space allocation and moving in your equipment to be ready to go. Other situations may essentially demand rebuilding before the facility is ready for use.

IMPROVEMENTS

A third alternative is to rent or lease space. This takes less capital outlay initially, especially if you are doubtful about the value of the location. It is well to remember, when renting or leasing, that anything you pay for changes in partition arrangement or facilities is usually lost if you move—and you have invested for your landlord's gain. Any improvements you make should be as minor as possible unless you are sure of the location and sign a long-term lease. However, money man be saved by making your improvements with movable partitions and by using cabinets and equipment as partitions. Being able to write the partitions and casework off as equipment will also result in a savings. The rent you pay, of course, is an operating expense.

In the majority of circumstances, those who rent invest only in the necessary paint, draperies, and equipment. As a result, they often put up with a makeshift and inconvenient arrangement of rooms, which causes inefficiency of operation to them and resulting loss of service to their patients.

SPACE

Space is the primary requirement when laying out the medical practice facility. But mere area is not enough in itself—it must be properly arranged. The average area for a doctor's "office" is about 1,000 sq. ft. It is possible, but not convenient or profitable, to have an office of no more than 200 sq. ft. On the other hand, some offices are as large as 2,500 sq. ft. per doctor. The minimum workable office is about 600 sq. ft. (fig. 1). When

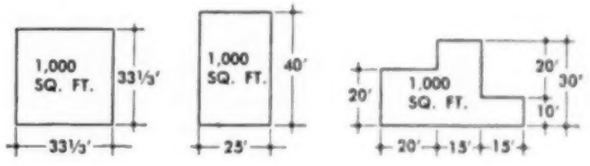

Fig. 1.—Average amount of office space needed.

more than two doctors combine or use an office jointly, it is possible to reduce the area per doctor to a certain extent, but this reduction is dependent on the management methods.

There is a tendency to squeeze too many people and too much equipment into too small an area. The room that has enough floor area to provide space for the equipment and furnishings and leave room to work comfortably without wasted steps is the ideal. One person needs a space 2 ft. wide to walk comfortably between equipment. Three feet will allow two people to meet and slip by each other, but at least 4 ft. is needed if two people are expected to work around each other without serious interference (fig. 2). Examination and treatment tables can be shoved

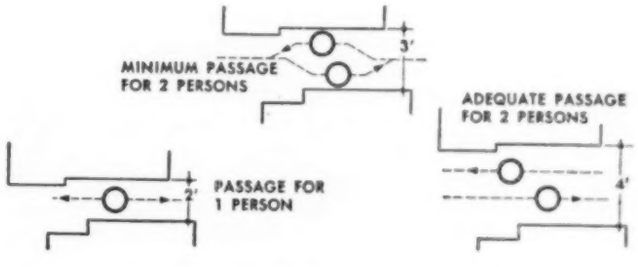

Fig. 2.—Area needed for adequate passage.

against a wall to save space, but it is much more efficient to be able to work from two sides and one end. Unquestionably, the right amount of space is the primary requisite for making an office efficient, comfortable, and satisfying to the doctor, his assistants, and his patients.

LAW DEPARTMENT

MEDICOLEGAL ABSTRACT

Medical Practice Acts: Revocation of License for Unprofessional and Incompetent Conduct.—The state medical examining board found the plaintiff guilty of unprofessional and incompetent conduct and recommended that his license to practice medicine and surgery be revoked. The health department accordingly revoked it. An appeal to the superior court was dismissed, so the plaintiff appealed to the Supreme Court of Errors of Connecticut.

The first charge of which the plaintiff was found guilty was that of unprofessional and incompetent conduct in failing to make necessary tests to corroborate the diagnosis of the ailment of his patient. The plaintiff was duly licensed to practice medicine and surgery in 1929 and, since then, had practiced in Danbury. In 1946, the plaintiff moved into the house in Danbury occupied by the patient, an elderly woman. She was not ill at this time. He lived there until her death on July 26, 1950. The patient was fond of the plaintiff and treated him as her son. In 1947 she executed a will naming the plaintiff as sole beneficiary and executor. In September, 1949, she made the plaintiff her joint tenant with respect to her real estate. Upon the patient's death, the plaintiff would acquire title to real estate worth $72,750 and personal property worth $1,578.75.

Shortly after May 19, 1950, the patient developed a severe attack of diarrhea and persistent vomiting, together with an infection of her mouth and gums. The infection of her mouth and gums cleared up after treatment by the plaintiff, but the patient otherwise did not respond fully to treatment. On June 18, 1950, the plaintiff called in a physician practicing in Danbury. The patient was in bed. She had a raw throat and an irritated rectum. The pulse rate was slow, even, and not strong, and the blood pressure was 100/60 mm. Hg. The heart sounds were weak. There was a mass in her abdomen, and she was weak. On the basis of the clinical signs and symptoms, the physician gave a tentative diagnosis of myocarditis, a possible nephritis, and a possible malignant condition of the colon, and he told the plaintiff that efforts should be made to confirm the diagnosis by x-ray and other tests. He repeated the recommendation that the diagnosis be confirmed by tests on other occasions. The plaintiff concurred in the tentative analysis, but, apart from one urinalysis and a half-hearted attempt to administer barium to the patient a week before her death so that an x-ray could be taken, no tests of any kind were made to confirm the tentative diagnosis.

The second charge of which the plaintiff was found guilty was that of unprofessional conduct in that he aided, abetted, and advised the physician, who had been called in on June 18, 1950, to sign a death certificate certifying the death of the patient before she actually died. The morning of the day on which the patient died the plaintiff called the physician and told him that the patient was slipping. The physician said he could not see her that day because he was going out of town. The plaintiff then asked the physician to sign a blank death certificate. The physician at first declined to do so but later left a signed blank death certificate at the patient's house, which was filled in by the plaintiff after the patient died. The certificate was immediately recorded, and the patient's body immediately sent to a medical school for anatomic purposes.

The final charge of which the board found the plaintiff guilty was that of unprofessional conduct, in view of the expressed desire of the patient to be buried, in making arrangements before her death for the transmission of her body to a medical school for anatomic purposes and in actually delivering her body to the medical school after her death. The plaintiff admitted that he conferred in the latter part of May, 1950, with representatives of the medical school, concerning the use of the patient's dead body for anatomic purposes. At the hearing, he testified that she wished her body used for such purposes. There was other evidence that she had expressed to friends the desire to be buried in the family plot in Danbury. In her will she had ordered payment of her burial expenses. The physician, who had been called in on June 18, 1950, testified that the plaintiff had never told him the patient's body was to be sent to the medical school and that, when he had suggested the advisability of an autopsy in the event of the patient's death, the plaintiff told him that the patient was opposed to any autopsy and wished to be cremated.

Section 4358 of the Connecticut General Statutes provides that a license to practice medicine and surgery may be suspended, revoked, or annulled for immoral, fraudulent, dishonorable, unprofessional, illegal, incompetent, or habitually negligent conduct. The Court said that the terms, "immoral," "dishonorable," or "unprofessional," under this statute include only conduct that either shows that the person guilty of this type of conduct is intellectually or morally incompetent to practice the profession or has committed an act or acts of a nature likely to jeopardize the interests of the public. The examining board was made up of five practicing physicians appointed by the governor upon recommendation of the Connecticut Medical Society, and it is to be presumed that they were qualified to pass on questions of professional conduct and competence. The Court pointed out that it is not its function on an appeal from a decision of a quasi-judicial body, such as the examining board, to retry the case; its function is to determine whether or not the board acted illegally or arbitrarily, which required an examination of the record to determine whether the conclusion reached was legally supported by the evidence.

As to the first charge, the Court said that there was evidence from which the board could reasonably conclude that the care and treatment given to the patient by the plaintiff fell far short of that required by professional standards, that it indicated an incompetence to practice medicine, and that it was thus unprofessional and incompetent conduct. The plaintiff's conduct in procuring the signed, blank death certificate, which certificate had to be recorded before the body could be sent to the medical school, and the immediate sending of the body to the medical school was of a nature likely to prejudice the interests of the public. Thus, said the Court, the board's conclusion that this was unprofessional conduct was not unreasonable or arbitrary. The Court said, with respect to the third charge, that, even though there was evidence on both sides of the question, a conclusion that the patient's body was delivered for anatomic purposes against her expressed wishes was not unwarranted. That the body was disposed of after the patient's death does not make the conduct any less unprofessional. As her executor, he had no right to dispose of the body as he might wish. As her physician, his conduct was such as to justify the board's conclusion that it was contrary to the ethics of the profession and, therefore, unprofessional conduct.

The board had the discretionary power to recommend revocation and, in the absence of an abuse of that discretion, its recommendation is not to be disturbed. There was no abuse of discretion here, said the Court, since the recommendation was based upon the cumulative effect of finding the plaintiff guilty on the three charges. Furthermore, there was no denial of due process in the health department's revocation of the plaintiff's license without conducting a hearing, since the department acts only upon the recommendation of the examining board before whom the plaintiff was given the hearing provided for by statute. The Court therefore affirmed the order revoking the plaintiff's license and dismissed the appeal. *Gibson v. Connecticut Medical Examining Board, 104 A. (2d) 890 (Conn., 1954).*

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Physiopathological and Clinical Observations on Action of Heparin in Syndrome of Angina Pectoris. Minerva med. **46:** 562-578 (Sept. 12) 1955 (In Italian) [Turin, Italy].

Heparin given intravenously in doses of 5,000 units every other day for an average of 15 days and afterwards twice a week for some time to 43 patients, 36 to 77 years of age, with angina pectoris was efficacious in 32. The clinical result, with complete disappearance or marked reduction of the number and severity of the attacks, became evident in all after three to four injections. The patients, in whom the anginal symptoms had been present for from several days to seven years, were followed for from a minimum of one month to a maximum of 18 months. One patient, a 67-year-old physician, whom the continuous attacks had forced to bed for three months, was able to resume his professional activity. The electrocardiograms of one-third of the 32 improved patients returned to normal or almost normal, but they did not change in the others, some of whom had infarcts of old standing, mitral valve defects, or aortic stenosis. Although the behavior of hypercholesteremia, present in 49% of the patients, was not studied in any particular way, a notable drop in the blood cholesterol level was noted in four patients after several months of treatment. In the 11 patients in whom hypertension was present, heparin did not cause hypotension. In one patient, a 77-year-old woman with diabetes and signs of hepatic and renal insufficiency who tolerated the therapy well for one week, attacks of angina pectoris occurred immediately after the injections, indicating a cause and effect relationship. It is probable that these attacks ascribable to "heparin sensitization" may have been due to allergic diathesis with functional deficit of the liver. Other phenomena of heparin intolerance were not observed in the patients, and in none of those who were benefited did attacks of angina pectoris or electrocardiographic alterations reappear after the therapy was suspended. The therapy was discontinued in the patients in whom it had failed from the first weeks. As to the mechanism of action of this anticoagulant in angina pectoris, the authors state that, in addition to its anticoagulant action, the drug's action on the lipoproteins must have played a part as well as its antiexudative action and its vasomotor action with lowering of the peripheral resistance and therefore hyperemia. It may be that patients with angina pectoris, most of whom have atherosclerosis, lack heparin or heparin-like substances. The authors reject the view of some workers that the beneficial effects of heparin in patients with angina pectoris are to be ascribed to the psychological effects of the therapy rather than to the effects of the anticoagulant.

Actinomycin C in Treatment of Advanced Hodgkin's Disease. J. R. Trounce, A. B. Wayte and J. M. Robson. Brit. M. J. **2:**1418-1419 (Dec. 10) 1955 [London, England].

Actinomycin C was given to six patients with Hodgkin's disease and one with a reticulum cell sarcoma. The disease was in an advanced stage in all seven patients, who had already been treated by radiotherapy, and all but one had received one or more courses of nitrogen mustard therapy; these, however, were not completed in two patients because of the toxic effects of the drug. The initial dose of actinomycin C given intravenously to the patients was 100 mcg. If no toxic effects were observed the dose was increased so that at the end of a week or 10 days the patient was receiving a daily dose of 400 mcg. The dose was then progressively increased to 600 mcg. and finally 800 mcg. daily. With doses of 400 mcg. or more the drug was dissolved in 285 cc. of sodium chloride solution and given by intravenous drip over about two to three hours. A total course of between 7,000 and 10,000 mcg. was used whenever possible. Only two of the seven patients showed a marked response to the treatment, with disappearance of fever and considerable reduction in the size of the lymph nodes and spleen. In one of these patients, improvement has been maintained for three months. Two other patients showed slight improvement, with some reduction in the size of lymph nodes and temporary disappearance of fever. The remaining three patients were therapeutic failures. The side-effects of the drug included stomatitis and thrombocytopenia. The importance of repeated examination of the blood in the course of the treatment is stressed. A trial with actinomycin C would seem to be worthy in patients with Hodgkin's disease when the other more usual methods of treatment have failed and particularly in those patients who for one reason or another are unable to take nitrogen mustard. The other possible use for the drug might be in combination with either deep roentgen ray or nitrogen mustard therapy in an attempt not only to increase the therapeutic effect but perhaps to prevent the appearance of resistance to further treatment at a later date in those patients who respond satisfactorily or to increase the sensitivity to irradiation of those patients who have become radioresistant.

Treatment of Toxic Adenomatous Goiter by Large Doses of Radioactive Iodine. J. R. Cook, R. W. Jones and E. P. McCullagh. J. Clin. Endocrinol. **15:**1512-1517 (Dec.) 1955 [Springfield, Ill.].

Earlier, the dosage of radioactive iodine in the treatment of toxic adenomatous goiter generally consisted of an initial dose of less than 20 mc. followed by small doses as necessary. In some instances, the total amount of radioactive iodine used was as much as 100 mc. The disadvantage of this plan is the long period before hyperthyroidism is adequately controlled, usually from 6 to 12 months. Between 1952 and 1954 the authors treated 31 patients having toxic adenomatous goiters, who either had refused surgery or were considered poor surgical risks, with large initial doses of radioactive iodine. Twenty-one received an initial dose of 20 to 40 mc. and 10 received an initial dose of 50 mc. or more. In 23 of the patients the hyperthyroidism was controlled within four months. Following an initial dose of 50 mc. or more, the hyperthyroidism appeared to be controlled more promptly and effectively than following a smaller initial, or a smaller repeated, dose. In no instance was the cardiac status aggravated by treatment. In some patients the initial therapy did not control the hyperthyroidism, but further treatment with radioactive iodine resulted in a euthyroid condition. In others the thyroidal uptake of radioactive iodine was too low, despite persistent thyrotoxicosis, to warrant repeated administration. The authors feel that when treatment other than surgery is to be used in toxic multinodular goiter, radioactive iodine should be given first consideration.

Observations upon 250 Cases of Bleeding Peptic Ulcer. W. K. Manning. M. J. Australia **2:**802-805 (Nov. 12) 1955 [Sydney, Australia].

The series of 250 patients reviewed includes all the patients with bleeding peptic ulcer admitted to the author's hospital during the five years from 1947 to 1952. Analysis of the 22 fatal cases revealed that 13 patients had had ulcer dyspepsia for many years, 5 had had ulcer dyspepsia for several months, and 4

The place of publication of the periodicals appears in brackets preceding each abstract.

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had only a short history of ulcer symptoms or none at all. Previous episodes of bleeding were recorded in only 3 of the 22 fatal cases. Autopsy was done in 19 cases and revealed chronic gastric ulcer in 8, chronic duodenal ulcer in 5, acute gastric ulcer in 5, and acute duodenal ulcer in one. Six of the patients died after surgical treatment to arrest the ulcer hemorrhage. Other serious diseases were present and contributed materially to the death from bleeding ulcer in 11 patients. There were five cases in which acute pulmonary edema was found at autopsy. This may have been due partly or wholly to overenergetic blood transfusion. The author presents observations on 228 nonfatal cases of bleeding ulcer treated medically. Analysis of the cases failed to provide any reliable criteria by which the small group of patients who will be cured only by surgical means can be selected. The author suggests that in the absence of such criteria the best results can be obtained by treating all patients with bleeding ulcer nonsurgicaly and accepting a certain mortality, which is probably not unduly high with appropriate medical treatment. There is a certain inevitable mortality rate among patients with bleeding peptic ulcer who are senile or have some other serious disease and who are unable to sustain the trauma either of severe blood loss or of operation. Observation in this series seems to indicate that the most important principle in successful medical treatment may be to restrict the use of blood transfusion as much as possible; it is suggested that in many cases recurrence of bleeding and/or death from pulmonary edema results from the free transfusion of blood. The impressions gathered by the observer in this series of cases have been strengthened by the observation of approximately another 250 cases in the years following the present study.

Conventional Therapy Versus the Continuous and Concurrent Use of Streptomycin, Isoniazid, and Para-Aminosalicylic Acid Plus Early Surgery in the Treatment of Tuberculosis: Two Year Report. A. R. Allen, G. E. Marcy and J. K. Yu. Dis. Chest **28:**537-547 (Nov.) 1955 [Chicago].

The results of two different methods of treating both pulmonary and extrapulmonary tuberculosis at the Central Washington Tuberculosis Hospital in Selah, Wash., were compared at the end of a two-year period (June 1, 1952, to June 1, 1954). One hundred ten patients (group 1) received aminosalicylic acid on admission and 1 gm. of streptomycin twice a week in courses, combined with rigid bed rest; collapse therapy, predominantly pneumoperitoneum; and resectional surgical treatment as indicated. After July 17, 1952, those who wished to take isoniazid were given the drug and its administration was continued until discharge. All three drugs, however, were not given concurrently and continuously. One hundred one patients (group 2) received streptomycin, aminosalicylic acid, and isoniazid continuously and concurrently combined with early resectional surgical treatment. Of the 110 patients in group 1, 104 received more streptomycin and aminosalicylic acid than the patients in group 2. Only 80 patients in group 1 received isoniazid. In both groups, those patients with minimal tuberculosis converted at a comparable time, i. e., 1.75 months in group 1 and 1.33 months in group 2. Beyond that, great differences were observed. In group 2, 99% of the patients had negative cultures at the end of six months and all had turned negative by the end of one year, against 57.27% of the patients in group 1. The patients in group 2 were positive for only 2.05 months as compared with 10.1 months in group 1. Patients in group 2 were subjected to surgical intervention in one-third of the time those in group 1 were; there were no postoperative deaths and few complications, while there were three postoperative deaths in group 1. The patients in group 2 were hospitalized for 222 days as against 661 days for those in group 1, and all of group 2 have been discharged from the hospital, while three of group 1 have been hospitalized continuously. Only 3 of the patients in group 2 had to be readmitted to hospital as compared with 10 in group 1, despite the fact that all patients in group 2 had returned immediately to their previous occupations. Streptomycin, aminosalicylic acid (PAS), and isoniazid given continuously and concurrently instead of in courses are more effective than any combination of two of these drugs; the three-drug therapy offers a slightly higher conversion rate in the first six-month period of treatment than previously reported, with the additional advantage of having no change in bacterial sensitivity until after six months of treatment. All toxic reactions to the three drugs occur in the course of the first 50 days of treatment except for nephritis, which may appear later; it occurred in three of four patients who were given dihydrostreptomycin after a dermatitis medicamentosa caused by streptomycin. Resectional surgery four to six months after the institution of chemotherapy is advisable and safe on the three-drug routine. Pronounced restriction of activity is not necessary during hospitalization and full activity does not cause reactivation after discharge from the hospital. This program of three-drug therapy combined with early surgical treatment proved effective in extrapulmonary and in pulmonary disease and there were no racial differences in regard to response. The program received splendid cooperation by the patients as shown by few irregular discharges, dropping from 20% in 1951 to 6% in 1952, and by the willingness of the patients to return for follow-up examination after discharge. It has left no chronic tuberculosis.

Constitutional Hyperbilirubinemia: Its Differential Diagnosis and the Effect of Steroid Therapy. M. P. Eanet and I. B. Brick. New England J. Med. **253:**1062-1065 (Dec. 15) 1955 [Boston].

The authors present the history of a 30-year-old man, who was hospitalized in October, 1953, with a chief complaint of anorexia of three weeks' duration. He had been intermittently jaundiced for five years. Early in 1951 he first noticed right-upper-quadrant aching. In July, 1952, he became more severely jaundiced and noted some darkening of the urine. There was a mild diarrhea, with lighter than normal stools. There was no anorexia or pruritus. He was hospitalized in August, 1952. Laboratory studies revealed elevation of the serum bilirubin content. The urine was positive for urobilinogen at 1:160 dilution. Liver biopsy revealed no abnormalities. The patient was treated with bed rest and a high-carbohydrate, high-protein, normal-fat diet with vitamin supplements. The jaundice cleared, and he was discharged on Oct. 3, 1952. He was hospitalized again on account of right-upper-quadrant pain and jaundice in March and in August, 1953. He was reassured that his jaundice was probably of no significance. The diagnosis was, as it had been previously, chronic hepatitis. In November, 1954, he was again hospitalized because of pain in the right upper quadrant of the abdomen. The physical findings were the same as at previous studies. The effects of corticotropin and cortisone on the serum bilirubin levels were investigated. Unlike some cases of jaundice due to hepatic or obstructive disease, in which steroid substances tend to lower the level of serum bilirubin, no significant effect was noticed. This case is typical of constitutional hyperbilirubinemia. This condition should be suspected in the young adult who is chronically and intermittently jaundiced without significant symptoms. The exclusion of obstructive jaundice and hepatocellular disease by the usual studies and of a more subtle hemolytic process by reticulocyte counts and quantitative fecal urobilinogen suggests the diagnosis. A normal liver biopsy specimen gives histological confirmation.

Irregular Discharges of Tuberculous Patients: An Analysis of 273 Cases. J. H. Sands, W. G. Grove, J. W. Hirsch and J. M. Drickey. Dis. Chest **28:**548-557 (Nov.) 1955 [Chicago].

Of 1,173 patients with pulmonary tuberculosis observed, treated, and discharged from Fitzsimmons Army Hospital in Denver, Colo., in 1952, 873 received regular discharges and 300 were discharged irregularly since termination of hospitalization was not medically sanctioned by professional authority. An analysis was made of the irregular discharge in 273 of the 300 patients. There were numerous causes for irregular discharges of tuberculous patients. Forty-five (16%) were unable to accept their disease as a reality, despite thorough educational programs in tuberculosis. Eighty-one (30%) refused to accept recommended treatment and 13 of these desired to control their treatment despite the fact that the financial responsibility for treatment was borne by the Veterans Administration and not by themselves. Lack of proximity to home was considered a factor in dissatisfaction of six patients (2%), resulting in their irregular discharge. Lack of emotional maturity to adjust to prolonged hospitalization was the basis of irregular discharges in 62 patients (22%).

Personal problems were the cause of irregular discharge in 74 patients (27%). Of the 273 patients 239 (88%) had active tuberculosis on discharge. Fifty per cent of these same patients had far advanced tuberculosis. Thirty-six per cent of these patients were "repeaters" of irregular discharges. The long hospitalization necessary today for adequate treatment of tuberculosis brings with it the intolerance of monotony and the struggle with dependency. Despite the medical team's efforts to help with these problems, many patients find the solution to their problems in the rejection of adequate medical care. It is anticipated that, if the future treatment of tuberculosis includes shorter hospitalization, these problems will be reduced. However, until such time as medical science and research can offer short-term treatment for tuberculosis, the problems of this chronic disease must be met realistically. Tuberculosis is a serious communicable disease that should require isolation, enforcible by law. New cases of tuberculosis are being discovered every day, because present systems of control are inadequate. The results of the reported study and the experience of treating many thousands of patients with tuberculosis have convinced the authors that the general welfare of every community demands more adequate protection against tuberculosis.

Fatal Hypersensitivity to PAS and Streptomycin. J. E. Hansen and E. A. Cleve. Dis. Chest **28:**577-579 (Nov.) 1955 [Chicago].

The first case in the United States of a fatal hypersensitivity reaction to aminosalicylic acid and streptomycin is described in a 22-year-old Negro airman with pulmonary tuberculosis admitted to the Letterman Army Hospital in San Francisco. Treatment with 3 gm. of aminosalicylic acid (PAS) orally four times daily was instituted on May 19, 1952, and with 1 gm. of streptomycin intramuscularly every third day on May 20, 1952. A pruritic maculopapular eruption occurred on the forehead on June 6, which within three days involved the entire body. A rise of temperature had occurred every third day from May 26 to June 7, shortly after each injection of streptomycin. This was believed to be the offending drug and its administration was discontinued. Severe conjunctivitis, increased lymphadenopathy, anorexia, and hacking cough developed and the patient's temperature rose to 105 F (40.5 C). On June 9, administration of aminosalicylic acid was discontinued and treatment with 400 to 600 mg. of tripelennamine (Pyribenzamine) hydrochloride was started. On June 12 the patient became agitated and required restraints. By June 15 the temperature had remained below 101 F (38.5 C) for 96 hours, and the adenopathy and rash had decreased. Aminosalicylic acid was reinstituted on June 16 in the dosage of 3 gm. four times daily. The patient's temperature again rose to 104 F (40 C) accompanied by stupor and a mild exacerbation of the skin eruption. Three hundred thousand units of aqueous procaine penicillin were given daily on June 17, 18, and 19, and 1 gm. of dihydrostreptomycin was given intramuscularly on June 19, causing further exacerbation of the rash. On June 20 the patient began to vomit. A blood cell count was made and showed eosinophilia and atypical lymphocytosis. In the morning of June 21 the patient had a grand mal convulsion and died. Jaundice was not apparent until death. Autopsy revealed widespread tuberculosis, acute hepatic necrosis, which caused the patient's death, and cerebral edema. The symptoms and findings in this patient were strikingly similar to those observed in patients who were sensitive to aminosalicylic acid and exceeded those reported as caused by sensitivity to streptomycin alone. The prompt exacerbation after reinstitution of aminosalicylic acid incriminates this drug. The temperature peaks at three-day intervals, coincident with the injections of streptomycin from May 27 to June 7, and the further exacerbation of the rash on June 20, after the injection of dihydrostreptomycin, incriminate these drugs as additional sensitizing agents.

Experiences with ACTH-Cortisone Treatment of Chronic Rheumatoid Arthritis. V. Forsbech and O. A. Sydnes. Tidsskr. norske lægefor. **75:**705-708 (Oct. 15) 1955 (In Norwegian) [Oslo, Norway].

The results of treatment with ACTH and cortisone in 243 patients with polyarthritis and spondylarthritis are evaluated. Short-term treatment with ACTH may give good clinical effect sometimes of long duration. Physical therapy should be utilized as much as possible in connection with the hormone treatment. ACTH therapy with relatively small doses (12.5 to 25 international units daily) is almost always tried when the patient does not react satisfactorily to conservative or usual physical treatment. If continued treatment over a longer period is needed, cortisone is preferred and can be given for a long time with doses sufficiently effective for many patients. The doses have been from 25 to 75 mg. daily, apportioned in four daily doses. The results, according to the patients' own statements, were satisfactory in about half the patients treated. If in long-term cortisone treatment the doses have to exceed 50 mg. daily for noticeable effect, care must be exercised in continuing the treatment. With the doses employed the side-effects are too slight to interfere with the application of ACTH and cortisone in rheumatoid arthritis. On withdrawal of cortisone the doses should be reduced gradually. The hormone effect is independent of the stage of the disease, and age and the duration of the disease play little part. The more marked the activity of the process, the more certain the effect of the cortisone. The treatment is strongly indicated when it allows the patient to become more independent. The authors are reserved in giving cortisone to adipose patients. Good cooperation between physician and patients is necessary. The treatment may call for a certain resignation on the patient's part. If for psychic reasons the patient's fitness for the treatment is doubtful, the treatment is best omitted.

Plasma Concentration of Penicillin and Streptomycin After Simultaneous Administration. V. Hassing, H. O. Juncher and F. Raaschou. Ugesk. læger **117:**1370-1373 (Oct. 20) 1955 (In Danish) [Copenhagen, Denmark].

A method for analyzing penicillin and streptomycin when these antibiotics are present in the same blood sample, based on the different rates of diffusion of the two substances in an agar medium, was applied in study of the plasma concentration of penicillin and streptomycin after simultaneous administration. The influence of streptomycin on the renal clearance of penicillin and of penicillin on the renal clearance of streptomycin was also investigated. The substances do not inhibit the excretion of one another when they are given simultaneously in therapeutic doses and there is therefore no reason not to apply combination preparations of penicillin and streptomycin.

Recognition of Psychiatric Disorders in General Practice. E. L. Caveny. J. Nat. M. A. **47:**388-392 (Nov.) 1955 [New York].

Psychiatric principles must be applied in history-taking and in the diagnostic evaluation of emotionally disturbed patients. The practitioner must know what the physician who is not a psychiatrist can and should do in the management of emotionally sick people who may or may not have physical symptoms and in the emergency management of disturbed patients, such as delirious, suicidal, excited, and acutely grief-stricken patients, as well as the mentally defective and the aged. The practitioner should also know what he cannot and should not do in the care and treatment of the mentally sick. This requires knowledge of referral to psychiatrists, hospitals, and clinics and, also, a realistic appraisal of the scope and limitations of modern methods in treating the mentally ill. A patient's trouble may be physical, psychological, or both. The physician must probe the patient's history and examine him physically and functionally. The fact that symptoms point to an organic causation of a disorder does not justify omitting psychological investigation. The doctor-patient relationship is one that involves two personalities. The physician must know himself as well as the patient. An emotional complaint on the part of the patient stirs up a negative resentful attitude in some physicians. They look upon such patients as "only neurotic." In the early recognition of psychiatric disorders the physician will be aided by bearing in mind that psychogenic factors are responsible for symptoms in more than half of his patients. He will then be more likely to search out psychological as well as physical causation and be less inclined to subordinate psychological investigations to laboratory tests. It is important for the physician to recognize true depressive-type

illness. Since suicide is not so frequent in neurotic as in psychotic depression, the practitioner should be able to differentiate between them. In psychotic depression the mood is more continuous and does not fluctuate with the environment, as it does in the neurotic. There are no cycles for neurotic depression, but it fluctuates according to the environmental situations. The psychotic depressive usually experiences insomnia in the early morning hours, whereas the psychoneurotic has difficulty in getting asleep or remaining asleep, but is inclined to make up for it in the morning. A psychiatric emergency that should be better known to the average physician is the hypomanic illness, which may go unrecognized only to bring havoc down on the patient and his family. The alertness of the general physician is of great importance, since these patients can be treated with electroconvulsive therapy. Early recognition of schizophrenia is important, because treatment during the early phases is more effective. Delirium must be recognized and adequately treated. Diagnosis and treatment of addiction to barbiturates is also an important problem for the practitioner.

European Outbreaks of the Far-Eastern (Korean) Type of Epidemic Hemorrhagic Fever (EHF). C. F. Mayer. Mil. Medicine **117:**502-507 (Dec.) 1955 [Washington, D. C.].

Epidemic hemorrhagic fever was observed in the American Armed Forces during the Korean conflict in 1951, and American physicians in Korea accepted the term used by the Japanese, who had recognized the disease in 1936 during their occupation of Manchuria. Mayer pointed out in 1951 that there was earlier Russian literature in existence on the same epidemic fever, and he proved that the Korean-Manchurian "epidemic hemorrhagic fever" is identical with the "endemic hemorrhagic nephrosonephritis" of the Siberian Far East. In this report the author calls attention to the fact that in recent years outbreaks of the Far-Eastern type of epidemic hemorrhagic fever were reported from several areas of Europe, including South-European Russia, Bulgaria, and Hungary. These reports suggest that the epidemic hemorrhagic fever of the Korean variety is perhaps a global disease. Since 1946 doctors in the southern part of European Russia have recognized an epidemic disease that has been proved to be clinically identical with hemorrhagic nephrosonephritis (which is the Far-Eastern type of epidemic hemorrhagic fever). The disease occurs among rural populations. Many of the sick are thrashers or workers with dusty grain; others tend to livestock or are engaged in other agricultural work. From Norway, Sweden, and Finland several strange epidemics of a peculiar disease of the kidney have been reported since 1951. The disease, which has become known as "Myhrman-Zetterholm epidemic nephropathy," has much similarity with the Far-Eastern type of epidemic hemorrhagic fever. An epidemic renal disease was also rampant in Yugoslavia in 1950 and the subsequent years. This ailment was originally described as a viral glomerular nephritis, but lately it has been diagnosed as acute interstitial nephritis of unknown etiology. Several recent articles in Bulgarian medical journals discuss certain native purpuric diseases under the vague term of "hemorrhagic fever." Epidemics of hemorrhagic fever occurred in 1952 and especially from June to September in 1953 in Hungarian troops. The Hungarian outbreaks were studied by competent pathologists, epidemiologists, and clinicians, and there can be no doubt that they were witnessing authentic outbreaks of the Far-Eastern type of epidemic hemorrhagic fever. Virological research on epidemic hemorrhagic fever has been largely fruitless: the virus, as well as its vector and host, its portal of entry, route of spread, or immune biology are still unknown. Sporadic cases of this virosis may have been put under other diagnostic labels. Only the pioneer and military types of group life, with their penetration into virgin forests, are apt to elicit epidemic outbreaks of this peculiar virosis. Russian investigators assume birthplaces or centers of epidemics and epizootics in the virgin areas of nature, that is, they believe that there are certain uninhabited areas where pathogenic agents of human diseases find a particularly favorable environment for their existence, propagation, and further evolution and that the Far-Eastern type of epidemic hemorrhagic fever is one of the many human diseases whose virus is born in virgin nature.

SURGERY

Clinical Observations Before and After Mitral Valvuloplasty: Physical, Radiologic, and Electrocardiographic Changes. J. F. Otto Jr., J. M. Hutcheson Jr., W. H. Abelmann and others. New England J. Med. **253:**995-1005 (Dec. 8) 1955 [Boston].

One hundred six patients, 30 men and 76 women, who underwent mitral valvuloplasty for predominant mitral stenosis without important associated disease, were followed up postoperatively for one to four and a half years. The results of physical examination, cardiac fluoroscopy, and electrocardiography were recorded and compared with the preoperative data. Changes that could be chiefly ascribed to alteration of the valve structure were the reductions in intensity of the mitral diastolic murmur and first heart sound in about half of the patients. The frequent production of a soft apical systolic murmur after valvuloplasty was not related to the surgeon's estimate of mitral incompetence after valve fracture and seemed to have no prognostic importance. The absence of an apical systolic murmur before surgery was good evidence that serious or prognostically significant mitral regurgitation did not exist. Changes related to the reduction of pressures proximal to the mitral valve included the diminution in intensity of a loud second pulmonic sound in one-third of the patients, the frequent disappearance of functional murmurs of pulmonary dilatation, definite radiological improvement in 22 (41%) of 54 patients with satisfactory roentgenograms, and reversion toward normal of electrocardiographic signs of right-axis deviation and clockwise rotation whenever these were pronounced before the surgical intervention. Most of these changes were roughly correlated with the degree of symptomatic improvement. Certain objective signs showed postoperative deterioration in a significant number of patients; a change for the worse in 17 (31%) of the 54 patients from whom satisfactory roentgenograms were obtained; and postoperative electrocardiographic evidence of hypertrophy of the left ventricle in 8 of the 106 patients. Such changes occurred more often in a prognostically unfavorable group, but the authors were unable to implicate rheumatic fever as a cause of poor results or deterioration in the course of the follow-up period. The presence of palpable valvular calcium could be predicted in almost all the patients by preoperative fluoroscopy, a finding of some prognostic significance since mitral insufficiency was much more frequent in calcified valves. However, the radiological diagnosis of mitral regurgitation by determination of atrial systolic expansion was of no value when the incompetence was not predominant. An excellent clinical result could be anticipated in most of the patients with electrocardiographic signs of hypertrophy of the right ventricle, since these signs are probably a measure of pronounced pulmonary hypertension amenable to surgical relief. The presence of patterns of incomplete right bundle-branch block alone had no prognostic significance. In some patients significant increases in systolic and pulse pressures occurred after valvuloplasty. Greatly improved patients often showed striking increases in body-tissue weight.

Successful Resection of a Large Aneurysm of the Upper Abdominal Aorta and Replacement with Homograft. S. N. Etheredge, J. Yee, J. V. Smith and others. Surgery **38:**1071-1081 (Dec.) 1955 [St. Louis].

The authors report a case of what they believe to be the first successful resection of an arteriosclerotic aneurysm of the upper abdominal aorta with division and anastomosis of the celiac and superior mesenteric arteries to the homograft replacement. The patient was only 37 years old and his left kidney had previously been operated on. For this reason the traumatic origin of the aneurysm was considered, the more so since there were no indications of a syphilitic origin. Surgical and histological observations definitely proved the arteriosclerotic nature of the aneurysm. The extensive involvement of the great vessels of the upper abdomen greatly complicated and prolonged the dissection. The difficulty in identifying the renal vessels was particularly disturbing, and this was due to the invasion of the left renal pedicle by the aneurysm and the posterior rotation of the right renal vessels due

to the huge aneurysmal sac overriding the aorta at this level. In view of the secondary dilatation of the aorta between the aneurysm and the diaphragm, the authors thought that this diseased area should be included in the resection. This additional segment moved the dissection and insertion of the shunt just high enough out of the operative field to make these procedures difficult. The marked posterior involvement of the distal aorta, which resulted in a posterior leak, threatened to nullify the effect of the surgical efforts. The authors have been impressed by this predominant posterior involvement of the aorta and iliac and femoral arteries in numerous other cases. Although the polyethylene shunt used by the authors measured only 0.5 cm. in inside diameter, they felt that it undoubtedly played a vital role in the handling of this case. By its use and by the step-procedure that they devised for division of the great abdominal vessels one at a time, they were able to keep blood flowing into all of the vital organs except for relatively short periods of time. This contributed to the patient's excellent postoperative course, which, except for the oliguria, was amazingly smooth. The authors feel that it is impossible to state at this time that the homograft is the ideal substitute for the resected vessel since the literature reports excellent results with some plastics that would be much simpler to obtain and to handle. They obtained their graft from the local artery bank.

Vertebral Body Fusion for Ruptured Lumbar Discs: A Roentgenographic Study. R. B. Cloward. Am. J. Surg. **90:**969-976 (Dec.) 1955 [New York].

The author first performed vertebral body fusion for the treatment of ruptured intervertebral disk in 1943, and, in the course of the past 10 years, he has operated on 427 patients with this lesion. Postoperative studies were made in 354 of these patients. Four operations are performed by surgeons for ruptured lumbar disks, namely, simple disk removal, posterior fusion only, posterior fusion combined with disk removal, and vertebral body fusion (after complete disk removal) combined with posterior fusion. By the latter procedure 15 to 40% more patients were permanently relieved of all symptoms than was possible when the author used the other operations. This high percentage of cures is attributed to: (1) removal of all potentially painful soft tissues that contain nerve elements, i. e., the facet capsule and the posterior annulus; (2) adequate decompression of the nerve roots by removal of all disk tissue and bony osteophytes that encroach upon them; and (3) restoration of the width of the intervertebral space and size of intervertebral foramen with interbody grafts and fusion of only the one pathological joint in the normal position. Changes in the vertebrae and the bone grafts seen in the roentgenogram include density of the grafts as the fusion progresses, subarticular sclerosis of vertebral bodies, changes in the osteophytes, and absorption of residual intraspinal Pantopaque. Refrigerated bank bone preserved in blood plasma was used by the author in 203, that is in about half, of the patients. No difference in rate of fusion or behavior could be detected roentgenographically between autogenous and the preserved homogenous bone. Roentgenologically verified fusion occurred in three to five months, the average time necessary for the interbody grafts to fuse. Solid interbody fusion was found in 328 or 93% of patients. Failure of fusion in 26 (7%) was due to absorption of the grafts, the cause of which was not determined. Bone placed posteriorly in the interlaminar operative defect fused in 60% of cases, was weak in 26%, and completely absorbed in 14%. Roentgenography revealed that posterior fusion required from five to eight months. Evidence of fusion of either the interbody grafts or the posterior grafts or both was demonstrated roentgenographically in 343 or 97% of patients. The author's roentgenographic studies have substantiated the belief of many surgeons that the ideal operation for fixation of the spine would be one in which the bodies of the vertebrae are fused, since with this operation one would anticipate more rapid fusion with less chance of failure and a higher percentage of symptom-free patients.

Paraffinoma of the Breast. L. F. Tinckler and F. E. Stock. Australian & New Zealand J. Surg. **25:**142-144 (Nov.) 1955 [Melbourne, Australia].

Paraffinoma of the breast is the term applied to the condition that results from the injection of either low-melting-point paraffin wax, liquid paraffin and beeswax, or a mixture thereof into the mammae for the cosmetic purpose of increasing the bust line. During the past three years seven cases of this type have come to the attention of the authors. The first of the three histories presented concerned a woman, aged 41, who had been employed as a cabaret entertainer. Six years before each breast had received six injections placed circumferentially. Paraffin wax heated beforehand was used for the injections, which were painful. Some bleeding occurred from the puncture sites. During the following week the breasts continued to be painful. The desired enlargement was however achieved, and she was well pleased with the result. The breasts felt heavy. For six months the cosmetic effect remained. Then multiple small vesicles developed and discharged white material. These sinuses alternately healed and broke down. For a long time she tolerated the discomfort of the discharging sinuses, but she was finally persuaded to have the breasts attended to. On examination each breast was occupied by a nodular mass, which occupied the whole extent of the organ with the exception of the axillary tail, of a vulcanite rubber consistency. A bilateral mastectomy was carried out, leaving large areas of chest wall for immediate split-skin grafting. Microscopic examination of the surgical specimens revealed virtually complete replacement of the normal breast tissue with fibrous tissue and aggregates of cystic spaces that contained deposits of paraffin wax. In two patients the wax migrated within the layer of superficial fascia from the breasts on to the anterior abdominal wall. One patient died of fat embolism as a result of having her breasts injected with paraffin. The authors feel that it is less remarkable that complications occur than that the breast tissue tolerates at all, for any length of time, the injection of a liquid foreign body into its substance. Breast paraffinomas have been an incidental finding in a few patients undergoing treatment for other conditions in whom the injections have apparently been innocuous.

"Ventral Hanging-Through" in Treatment of Lumbar Herniated Disks. J. Weiss and F. Brussatis. Arch. orthop. u. Unfall-Chir. **47:**612-630 (No. 6) 1955 (In German) [Munich, Germany].

Since 1949 it has been the practice of the orthopedic clinic, Balgrist, in Zürich, to treat patients with sciatica due to hernia of an intervertebral disk with the procedure they designate as "ventral hanging-through." Preliminary conservative measures usually consist of bed rest, analgesics, the application of hot air, poultices, histamine iontophoresis, and massage of the lumbar region. Injections of Irgapyrin (phenylbutazone) are also given. Examinations include roentgenologic examination of the lumbosacral region in anteroposterior and lateral exposures. A lumbar puncture is carried out. Considerable increase in the total protein content in the cerebrospinal fluid contraindicates the use of ventral hanging-through. Myelography should be carried out in all patients with bilateral or alternating sciatica with severe Lasègue's phenomenon. These patients may have a large median herniation of a disk and should not be treated with ventral hanging-through, because this procedure may cause massive disk prolapse and compression of the cauda equina. After it has been decided that ventral hanging-through is to be tried, the patient is given a high enema and urged to take large amounts of fluid. During the night preceding the treatment, a barbiturate suppository is given, and in the morning 0.01 gm. of morphine and 0.0005 gm. of atropine are given by subcutaneous injection. General anesthesia is induced, while the patient is lying flat on his back. After the anesthesia has become adequately deep, the patient is given a short-acting muscular relaxant by intravenous injection. Then the patient is placed in the prone position on the table that is used for the ventral hanging-through procedure. The upper transverse belt passes over the upper sternal rim and the lower one about a hand's breadth below the patella. The table used is like that employed by Abbott for applying a plaster cast to patients with scoliosis. The head rests in a rubber bowl.

An assistant holds the patient by the ankles and sees to it that the knee joints do not become overstretched. A second assistant stands ready to eventually support the patient at the shoulders. Complete muscular relaxation usually is obtained about one minute after the injection of the relaxant. The longitudinal strap is gradually loosened and a maximal lordosis position is maintained in the ventral hanging-through for from two to three minutes. Then the longitudinal strap is gradually rolled up again so that physiological lordosis position is restored. Then a circular plaster of paris cast is applied to the body. The authors regard the procedure of ventral hanging-through as comparable to an operation and the after-treatment therefore requires careful attention. Precautions must be taken against ileus. The patient is at first given unsweetened tea, and only after flatus has passed is more fluid and food given. Getting up in the afternoon after the procedure will aid in counteracting urinary retention. If the bladder has not been emptied before night, catheterization should be employed. The patient is kept in the clinic for two or three days or until he is used to the plaster corset. Control examinations are carried out at monthly intervals and the plaster is removed at the end of three months. After that the patient wears a lumbar binder, but during a transitional period the plaster corset is used during the night. The authors used ventral hanging-through in 245 patients who had sciatica in the presence of a herniated disk in the lumbar region. Follow-up studies could be made in 92 patients in whom at least a year had elapsed since the ventral hanging-through. Thirty-five per cent of the patients achieved complete freedom from symptoms, 25% were greatly improved, and 15% were moderately improved, so that ventral hanging-through had a favorable effect in 75% of the patients. In 18 cases the ventral hanging-through treatment was repeated.

Nonoperative Treatment, Including Manipulation, for Lumbar Intervertebral Disc Syndrome. M. C. Mensor. J. Bone & Joint Surg. **37A:**925-936 (Oct.) 1955 [Boston].

Manipulation as a form of therapy for low-back disabilities has been used for many years with gratifying results. Mensor is able to report satisfactory results in 64% of private patients and 45% of industrial patients. This report is a result of an analysis of 285 patients observed over a 10-year period in whom the diagnosis of a protrusion of a lumbar intervertebral disk was made. In order to substantiate such a diagnosis, consideration was given to the type, onset, and localization of the low-back pain, the tenderness and the limitation of spinal motion (especially the flattening of the lumbar arc on forward bending), straigt-leg-raising, reflex changes, sensory changes, motor weakness and atrophy, and the amount of incapacity. Roentgenograms were made through the following exposures: anteroposterior, lateral (with the patient standing), spot lateral focused over the lumbosacral area, right and left oblique stereoscopics, and one of the lumbosacral region at a 45-degree angle. Myelograms were not made routinely, because the author believes that the diagnosis can and should be made clinically, the myelogram being reserved for doubtful cases and for those patients upon whom surgery is to be performed for confirmation and localization of the lesion. The author found that a conservative regimen that includes manipulative treatment of lower lumbar intervertebral disk syndrome under anesthesia eventuates in a sufficiently high percentage of satisfactory results to warrant its precedence over surgical intervention, except in those cases in which there is a definite contraindication. Satisfactory results, if obtainable, are to be expected after one or, at the most, two manipulations; repeated manipulation is not justified. Successful treatment is predicated upon a prompt loss of sciatic pain. Failure to respond to an organized regimen of conservative treatment, including manipulation under anesthesia, warrants prompt surgical intervention, provided the incapacity is sufficiently pronounced. A certain percentage of cases are not amenable to manipulation, but premanipulation differentiation is impossible. This series reveals a higher percentage of complete symptomatic relief following manipulation and its accompanying regimen than that following surgery, with a lesser amount of permanent disability in those cases in which residual disability persists. The apparent discrepancies in end-results between the private and the industrial patient can be explained by the monetary factor and the larger percentage of the latter patients engaged in heavy labor.

NEUROLOGY & PSYCHIATRY

Treatment of Mental Patients with a Preparation of the Total Alkaloids of Rauwolfia Serpentina Benth. M. Torsegno and M. Zucchi. Minerva med. **46:**604-607 (Sept. 15) 1955 (In Italian) [Turin, Italy].

Twenty institutionalized mental patients, 18 of them with chronic schizophrenia, were given daily for 30 days by the intramuscular route in two divided doses 10 mg. of a preparation containing the total alkaloids of Rauwolfia serpentina. After the first 30 days, the drug was given orally, six tablets daily (8.4 mg. of the total alkaloids) for 20 days. Five patients received 20 mg. of the preparation daily. During the therapy period, improvement of the symptoms, especially of the psychomotor agitation, was seen in all but one patient. Twenty days after discontinuance of the therapy, marked improvement was present in 14 patients; the psychomotor agitation had disappeared; greater social and environmental interest was present in all; and, in one patient, a slight improvement in dissociation was present. However, the improvement that had been observed during the treatment period was no longer present in five patients at this time. The condition of one schizophrenic patient who had extreme depression and suicidal ideas was aggravated by the 30th day of therapy; his suicidal ideas had become stronger and he himself had become extremely sitophobic. Although the therapy was continued, the patient did not improve. His condition was markedly improved by electroshock therapy. The effects obtained with the total alkaloids of Rauwolfia serpentina are comparable to those obtained with reserpine alone but with the former the side-reactions are none or very slight. The neurological symptoms of parkinsonian type that are experienced subjectively and objectively by patients treated with reserpine alone were never observed in these patients, nor was water retention noted. The amount of reserpine present in the preparation of total alkaloids given to these patients was notably smaller (2.5 mg. in 10 mg. of the preparation) than that usually given when reserpine alone is used. The authors attribute to the other alkaloids present in Rauwolfia serpentina a therapeutic action on mental disease that is similar to that of reserpine.

Poliomyelitis: Its Highly Invasive Nature and Narrow Stream of Infection in a Community of High Socioeconomic Level. J. P. Nolan, B. H. Wilmer and J. L. Melnick. New England J. Med. **253:**945-954 (Dec. 1) 1955 [Boston].

Localized epidemics of poliomyelitis in small communities with a high standard of living have tended to be characterized, in recent years, by the occurrence of disease among adults as well as children. This paper reports an investigation of such an epidemic. During the month of June, 1954, seven cases of poliomyelitis were reported from New Canaan, a well-to-do small community in southern Connecticut. Four of the first five patients had attended the same nursery school; the fifth was the mother of one of these children. With this group of localized cases it was hoped to determine the extent of spread of the infection through the families of reported cases, through the other children in attendance at the nursery school, and to the mothers of nursery-school children. The peak of the epidemic was seen in the first week of July, when five new cases occurred. The incidence then dropped off, with the last reported case on July 23. The final total was 16 cases, representing an attack rate of 2 per 1,000 population. Of the 16 cases reported, 6 were in adults, 5 of whom were 30 to 36 years of age. The large number of cases in adults can best be understood in terms of two influences. One is the tendency for persons in high socioeconomic groups such as this one to acquire immunity at an older age than those in lower groups. The other is in the story of the epidemic; all adult patients were parents of children in whom inapparent and clinical infection was common, and these parents were therefore heavily and intimately exposed to the virus. Serologic tests were performed on 106 persons. The complement-fixation test was positive for recent infection in 92% of the patients tested and in 40% of their contacts. Only in children under six years of age were predominantly monotypic responses obtained to the type of virus isolated in the stools. The neutralization test proved of little value as a diagnostic tool in

this study, because the titers had usually reached high levels by the time the first sample was drawn. Virus was recovered from the gastrointestinal tract in 67 of 114 persons tested. All virus obtained was type 1, with the exception of three strains recovered from members of one family who were excreting a type 2 strain. Virus was recovered from 88% of the patients and 54% of all contacts. Stool samples yielded virus about twice as often as rectal swabs obtained from the same persons. Virus was recovered twice as frequently from symptomatic contacts exhibiting minor illnesses as from those with no symptoms.

GYNECOLOGY & OBSTETRICS

Etiology of Ectopic Pregnancy: A New Concept. J. G. Asherman. Obst. & Gynec. **6:**619-624 (Dec.) 1955 [New York].

Of 325 women studied by the author, 251 were operated on for ectopic pregnancy at the gynecologic and obstetric department of the Hadassah Municipal Hospital in Tel-Aviv, Israel, and 74 were private patients with various complaints and diseases who had a history of tubal pregnancy. Of these 325 patients, only one had had gonorrhea; 4 had tubal tuberculosis; and 30 had had previous operations, 21 for ectopic pregnancy, 5 for ovarian cystectomies, one for appendicitis, one for a cause unknown, and 2 had cesarean section. Fifty-four women had been treated for primary or secondary infertility, and 181 had had one or more abortions, either spontaneous or induced. It is significant that nearly 56% of the 325 patients had had one or more curettages previous to their tubal pregnancy. Full patency or lack of anatomic changes of the fallopian tubes will not necessarily suffice to insure their normal functioning. The movements of the tubal muscles are as dependent on the hormonal as on the nervous system. Any disturbance in the neuroendocrine balance is likely to bring about a change in the normal functioning of the tubes and may result in infertility or tubal pregnancy, depending on the severity of the disturbance. Among the 325 patients, there were 21 recurrent ectopic pregnancies, an incidence of 6.5%. The prevailing theory to the effect that ectopic pregnancy is caused by inflammatory or developmental changes in the anatomy of the tubes must be revised, although it may be correct in a certain percentage of cases. The predominant cause of ectopic pregnancy seems to be functional disturbance of the autonomic nervous system resulting from emotional conflicts and causing tubal dyskinesia. This cause is common both in ectopic pregnancy and in psychogenic infertility, explaining perhaps why both conditions occur frequently in the same woman. Before diagnosing psychogenically caused extrauterine pregnancy, one should eliminate the presence of all anatomic and endocrine disturbances as probable causes.

Spinal Anesthesia in More Than 500 Vaginal Deliveries. M. Elkins. J. Oklahoma M. A. **48:**413-416 (Dec.) 1955 [Oklahoma City].

The simple and practical technique of spinal anesthesia, which Elkins employed for labor and vaginal deliveries in 500 women, uses a dose of 20 to 22 mg. of Pontocaine. The anesthesia is given early in labor. An analysis of the last 100 consecutive cases showed absence of major central nervous system complications, a 4% incidence of postspinal headaches, and a 6% incidence of drop in blood pressure severe enough to require small doses of ephedrine. When properly applied, this method results in an almost complete freedom from pain during labor and delivery. The problems in infant resuscitation are reduced to a minimum. With the adjustment to a routine, the clinical procedure is very simple to administer and supervise, and is therefore easily adaptable to general practice. The procedure is safe, as illustrated by the fact that not a single maternal mortality attributable to anesthesia has occurred in more than 500 cases. An average total period of hospitalization of 3.1 days for labor and postpartum care in a group composed of 46% primiparas and 26% abnormal presentations is financially favorable to the patient and/or insurance company. A minimum of special postpartum procedures is a great help to hospitals with a shortage of nurses.

Incidence of Poliomyelitis in Pregnancy: Its Relation to Maternal Age, Parity and Gestational Period. M. Siegel and M. Greenberg. New England J. Med. **253:**841-847 (Nov. 17) 1955 [Boston].

The authors investigated the reported cases of poliomyelitis occurring in New York City from 1949 to 1953 inclusive. The patients were seen within a week of notification by a diagnostician for the confirmation of clinical diagnosis and the collection of epidemiological data. The diagnosis of poliomyelitis was based on the presence of three or more of the following criteria: an acute onset, with fever; stiff neck or back; increased white blood cell count in the spinal fluid; increased protein in the spinal fluid; and flaccid paralysis. About 20 to 25% of reported illnesses failed to meet these diagnostic criteria and were excluded from the study. Patients in the childbearing age were again visited within three or four months for additional data on paralysis, marital status, and evidence of pregnancy at the time of the attack of poliomyelitis. Those who were pregnant at the onset of poliomyelitis were further followed for information on the condition of the infant at the time of delivery and a year later. The investigation was limited to women 15 to 44 years of age. A total of 87 cases of poliomyelitis were observed in pregnant women. This number was 59% more than that expected on the basis of age-specific rates in the female population of childbearing age. The percentage increase in clinical infections noted during pregnancy was the same for paralytic and nonparalytic cases. The attack rate of clinical infection was higher in pregnant women with previous live births than in those without previous live births. A relation between parity and the incidence of poliomyelitis in pregnancy was observed in each maternal age group and appeared to be dependent, in part, on the number of children in the household. The incidence of clinical infection also varied with the period of gestation, being increased only in the third, fourth, and fifth months, and possibly in the last month of pregnancy. The increase in incidence during pregnancy appeared to be limited to nonparalytic and spinal paralytic cases, whereas the frequency of bulbar cases seemed to be reduced. Mortality, therefore, was also reduced. Only two fatal cases occurred, both in the last trimester of pregnancy.

OTOLARYNGOLOGY

The Rational Approach to Immunization of the Upper Respiratory Tract. T. E. Walsh. A. M. A. Arch. Otolaryng. **62:**569-572 (Dec.) 1955 [Chicago].

Investigations of recent years on the role of viruses in infections of the upper respiratory tract indicate that several viruses are probably responsible for upper respiratory infection and that this viral disease when uncomplicated by secondary bacterial invasion is self-limiting and lasts from two days to a week. The upper respiratory infections seen by the otolaryngologist are due to the invasion of the tissues of the nose and throat and accessory sinuses by bacteria. The stage for this invasion may be set by a virus infection in some instances or by the breakdown of normal nasal defenses. The morbidity due to bacterial infection is far greater than that due to any virus infection. In the light of the increasing resistance to the antibiotics of many strains of bacteria causing upper respiratory infections, the problem of immunization of the respiratory tract gains importance. Experimental and clinical evidence points to local vaccination as the rational approach to protection of the respiratory tissues. The author described results obtained with an intranasal vaccine spray in 1940, and his observations on 627 patients in an eight-year period showed that protection is conferred on 84% of the patients. Because the antibody produced is specific for the organisms used in the vaccine, a polyvalent vaccine containing as many as possible of the common respiratory pathogens should be used. It is also important that the vaccine contain sufficient numbers of killed organisms. The recommended turbidity of the final mixture is approximately equivalent to that of one billion staphylococci per cubic centimeter as measured on a McFarland nephelometer scale. The author shows that Respiratory "UBA" has proved of

no value as a substitute for a suspension of killed organisms. He suggests that vaccine might prove useful in the treatment of chronic sinusitis.

Hypothyroidism as a Cause of Headache. A. Curtis Jones Jr. A. M. A. Arch. Otolaryng. **62:**583-585 (Dec.) 1955 [Chicago].

The author points out that some headaches are caused by a low metabolic rate. He reviews observations on 118 patients with this type of headache, who were observed in the course of six years, and he shows that these headaches can be relieved by administration of thyroid extract. It is essential that prior to treatment a detailed history be obtained to rule out any other cause of the headache and that a physical examination be performed to determine whether any other pathological condition exists. The only contributory physical findings are an infraorbital edema, subnormal afternoon temperature, and a slow resting pulse rate. Repeated basal metabolic rate determinations are necessary to find the actual basal metabolic rate of each patient, and during treatment with thyroid extract further basal metabolic rate determinations must be made to make sure that the patient is receiving adequate treatment.

PATHOLOGY

Intestinal Metaplasia of the Gastric Mucosa. B. C. Morson. Brit. J. Cancer **9:**365-376 (Sept.) 1955 [London, England].

Morson points out that during histological examination of gastrectomy specimens it is not uncommon to find areas of intestinal epithelium in the gastric mucosa. This type of epithelium has, in the past, been regarded as a congenital abnormality, but the majority of observers in recent years favor the view that the intestinal epithelium seen in the gastric mucosa is the result of faulty regeneration of surface epithelium in a mucosa repeatedly damaged by gastritis and is an example of metaplasia resulting from chronic irritation. To obtain more data on this problem the author made studies on 52 gastrectomy specimens removed for duodenal ulcer, 28 removed for gastric ulcer, and 39 removed for carcinoma of the stomach. Strips of stomach wall, about 1 cm. wide, were taken from the entire length of the lesser and greater curvatures of every specimen; the pylorus was included in each strip. These varied from 5 to 10 inches long. They were rolled up like a "swiss roll" and secured in position by a fine thread tied around the circumference. In some cases it was convenient to dissect the mucosa off the submucosa and roll up the mucous membrane by itself. By this method very long strips of gastric mucosa can be examined in one section. Of the total of 119 stomachs examined, 93 or 78.2% revealed intestinal metaplasia. Thus it is shown that intestinal metaplasia is a common finding, provided large areas of the gastric mucosa are examined. Its incidence and extent is greatest in stomachs removed for carcinoma and least in those with duodenal ulcer, with cases of gastric ulcer taking an intermediate position. In stomachs removed for duodenal ulcer, intestinal metaplasia is mostly confined to the pylorus and is seldom extensive. In stomachs removed for gastric ulcer, the incidence and extent of intestinal metaplasia is greatest at the pylorus and least on the greater curve with the lesser curve taking an intermediate position. In stomachs removed for carcinoma, intestinal metaplasia is distributed more evenly over the three sites than in duodenal or gastric ulcer, but it is still greatest at the pylorus, followed by the lesser and greater curves in that order. Thus the incidence and extent of intestinal metaplasia in all three groups of stomachs show that the part of the stomach most frequently and extensively affected by intestinal metaplasia is the pylorus and lesser curve or the gastric canal.

Carcinoma Arising from Areas of Intestinal Metaplasia in the Gastric Mucosa. B. C. Morson. Brit. J. Cancer **9:**377-385 (Sept.) 1955 [London, England].

In this paper the author presents evidence that gastric carcinoma may arise from areas of intestinal metaplasia. Five examples of the origin of gastric carcinoma from areas of intestinal metaplasia are described and illustrated with photomicrographs. In the first of these a gastrectomy specimen is described that contains a very early carcinoma apparently arising from an intestinal type of epithelium. In examples 2 and 3 the transition from metaplastic mucosa to carcinoma at the edge of a primary tumor is demonstrated. In neither of these cases is there any invasion of the submucosa at the point of transition, and the histological appearances do not suggest invasion of the mucous membrane from without. In the last two examples the appearances of preinvasive carcinoma or carcinoma in situ arising in epithelium of intestinal type are described. These two examples were found in gastrectomy specimens removed for carcinoma, but at a distance from the main tumor. They may be regarded as independent primary foci of malignancy. As regards the percentage of gastric carcinomas that arise from areas of intestinal metaplasia, the author says that, of the 107 primary carcinomas examined in this study, 35, or 32.7%, appeared to arise from epithelium of intestinal type. Taking other observations into account he estimates that about 30% of gastric carcinomas arise from areas of intestinal metaplasia. He also comments on the distribution of intestinal metaplasia in the stomachs of patients with pernicious anemia and on its significance in the increased incidence of gastric carcinoma in patients with pernicious anemia.

THERAPEUTICS

Potentiation of Antirheumatic Efficacy of Sodium Salicylate by Its Intravenous Administration in Hypertonic Glucose Solution. L. Perosa and P. De Vita. Riforma med. **69:**1125-1130 (Oct. 8) 1955 (In Italian) [Naples, Italy].

Intravenous drip administration of 6 to 8 gm. of sodium salicylate dissolved in 1,000 cc. of a 40% hypertonic glucose solution for 6 to 8 hours and followed by the oral administration of sodium salicylate, so that a total dose of 8, 10, or 12 gm. of it was given in the course of 24 hours, was efficacious in 15 patients with rheumatic infection. The results were better than those that follow the administration of this salicylate by other routes and other methods. A radical change in the clinical findings was observed almost always after the first infusion. Patients who had been incapacitated for weeks were greatly improved: pain disappeared almost completely, the signs of periarticular inflammation regressed, the joint exudate was reabsorbed, and fever subsided. This method is devoid of grave danger despite the fact that often during the first hour of the infusion the patient is seized by a chill that may be followed by signs of a mild circulatory collapse and elevation of temperature. These side-effects can be checked easily by discontinuing the administration of the medicament for 15 to 30 minutes and then resuming it. The onset of acute pulmonary edema in one of the first patients who was treated suggested that the use of mercurial diuretics may be greatly beneficial. The one drawback of this method is the fact that, because of the rapid disappearance of fever, joint swelling, and pain, the patients have the sensation of a complete recovery and refuse to continue the treatment. A reactivation of the condition was never observed during the treatment period, and a relapse occurred in only two patients two and four months, respectively, after the discontinuance of the therapy. It is premature to state whether the sodium salicylate administered intravenously in a hypertonic glucose solution has also an antigranulomatous action, but in one patient Meynet's nodules that had been present on the forearms disappeared. Studies are in progress to determine the mechanism of action of this method of treatment in patients with rheumatic infection.

RADIOLOGY

Roentgen Therapy of Puerperal Mastitis. L. Rossi, A. Rabaiotti and C. Bocchialini. Minerva ginec. **7:**669-672 (Oct. 15) 1955 (In Italian) [Turin, Italy].

A follow-up of 100 patients with puerperal mastitis who received roentgen therapy at the University of Parma Institute of Radiology during 1953 and 1954 showed favorable and often brilliant results in most of them. This was especially true of the patients (the majority) with initial forms of lymphangitis and parenchymatous mastitis who received the treatment within 24

hours after the onset of the symptoms. The process regressed rapidly with great relief to the patients, who were able to breast feed their infants 48 hours after the irradiation. In six patients who were seen after suppuration was already present, the process did not regress rapidly and two, sometimes three, irradiations were needed. The results were good also in these patients because after the irradiation it was possible to aspirate the pus from the abscess, and the process then regressed. Roentgen therapy gives the best results in puerperal mastitis when it is instituted early, generally within 24 hours from the onset of the symptoms. It is beneficial for patients with the more advanced phases of the condition because it accelerates the process of liquefaction of the infiltrate, stimulates the processes of humoral and tissue defense, and thus tends to check the eventual spreading of the condition. Surgical intervention, when necessary, becomes less grave and often evacuation of the abscessed focus by means of a syringe is sufficient to bring about recovery. The fear of an eventual inhibitory action of the therapy on the milk secretion with resulting hypogalactia is unjustified because the therapeutic doses of roentgen rays to be used are such that they cannot influence the milk secretion. The authors used medium hardness rays and administered a dose of 80 r to their patients. For most of them one such dose was sufficient; those with the more advanced stages of mastitis were given two or three such doses. Larger doses may bring about opposite results, among them a decreased activity of the reticuloendothelial system and inhibition of the formation of antibodies. The authors advocate the early use of roentgen therapy for patients with puerperal mastitis because a prompt and definitive recovery can be obtained and also because those complications that often make it necessary definitively to interrupt breast feeding are prevented.

Treatment of Thyrotoxicosis with Radioactive Iodine: Review of 140 Cases. G. W. Blomfield, J. C. Jones, H. Miller and others. Brit. M. J. **2:**1223-1229 (Nov. 19) 1955 [London, England].

Of 140 patients with thyrotoxicosis treated with radioactive iodine (I^{131}) at Sheffield, England, 106 were women and 34 were men, and their average age was 48.9 years. Sixty-six patients (47%) had diffuse goiter and 28 (20%) had nodular goiter; the thyroid was not enlarged in 20 (14%), thyrotoxicosis had recurred in 17 (12%) after previous thyroidectomy, a single toxic adenoma was present in 6 (4%), and in 3 patients (2%) the type of the gland was not known. The necessary estimates of the size of the thyroid, peak uptake of radioactive iodine, and effective half-life of the isotope in the thyroid were obtained from a preliminary radioactive iodine tracer study that was carried out ambulatorily. The patient then was admitted to hospital and was given a therapeutic drink of radioactive iodine. The authors attempted to deliver to the thyroid a dose of between 6,000 and 8,000 rads in a single drink; one rad equals 100 ergs per gram of tissue. Eighty-seven patients (62%) were made euthyroid with one therapeutic drink, and ultimately 118 patients (84%) were euthyroid. Two drinks were required in 25 patients (18%) and in 6 (4%) three or more drinks were required. Four to six months were allowed to elapse between successive doses. Seventeen patients (12%) showed evidence of hypothyroidism, and six (4%) still had toxic reactions at the time the authors presented their paper for publication. Statistical evaluation of the results showed that for a given rad dose the success of a first treatment was related to the mass of the thyroid and to the percentage of protein-bound radioactive iodine in the blood 48 hours after the administration of a tracer dose. The obvious advantages of radioactive iodine therapy are its immediate safety and the certainty of being able to produce a remission with a minimum of discomfort to the patient, although this is achieved somewhat more slowly than by other therapeutic measures. Its disadvantages are the possible late development of carcinomatous changes in the thyroid and the somewhat high incidence of hypothyroidism. The risk of neoplastic change in the thyroid after radioactive iodine therapy is small. There is evidence that it is not likely to occur in man following the use of radioactive iodine alone in therapeutic doses. In some of the authors' patients both articular and nonarticular rheumatic lesions developed, probably unrelated to isotope therapy. While it is probably sufficient in many cases to prescribe a therapeutic drink solely on the basis of type and size of the thyroid, it is felt that experience with I^{131} therapy is as yet too short to allow a general adoption of empirical dose prescription. Radioactive iodine therapy should be restricted to the following groups of patients: those over 45 years of age; those in whom associated disease reduces life expectancy to less than 20 years, i. e., to less than the latent period for the development of carcinoma; those who are refractory or hypersensitive to antithyroid drugs and in whom thyroidectomy is either contraindicated or refused; those with recurrence of disease after thyroidectomy; and those with heart disease associated with thyrotoxicosis. The only important contraindication is pregnancy.

Treatment of Thyrotoxicosis with Radioactive Iodine (I^{131}). B. C. Christensen, V. Dahl, K. B. Petersen and B. Strange. Ugesk. læger **117:**1303-1310 (Oct. 6) 1955 (In Danish) [Copenhagen, Denmark].

Of the 50 patients with thyrotoxicosis treated with radioactive iodine in the medical department of the Finsen Institute from June, 1948, to May, 1955, the 45 with sufficiently long observation period are included in this report. In 37 cases one dose was given, in 4 cases two doses were applied, in 2 cases three doses, in one case four doses, and in one case seven doses. Thirty-four patients were cured and 5, improved; 3 were myxedematous and 2, unchanged; and one death occurred. The average total dose of radioactive iodine given was 7.9 mc. It is stressed that operative treatment is still to be considered the normal method. Because of possible secondary development of cancer after a long latent period and possible gene damage, treatment with radioactive iodine should not be applied in patients under 45 and should be limited to those with complicating heart disease, especially dilatation of the heart with decompensation; advanced age; earlier thyroidectomy or large intrathoracic goiter, and the few cases where in spite of adequate treatment the patient cannot be brought into a condition suitable for operation. The percentage of cure is about 70 to 80%. There is no risk of recurrent nerve paresis or parathyroprival tetany. The frequency of myxedema corresponds to that after surgical treatment.

Effect of Somatotropic Hormone on Swine Exposed to Whole Body X-Irradiation. H. Baxter, R. G. Randall, G. C. McMillan and others. Plast. & Reconstruct. Surg. **16:**387-391 (Nov.) 1955 [Baltimore].

The authors point out that Selye found that rats, subjected to 671 r in two exposures six days apart and treated twice daily with subcutaneous injections of 1.5 mg. of somatotropin gained, while the controls lost, weight during the second and third weeks postirradiation. The mortality of the treated rats was not reduced. Gordon and associates treated mice exposed to 550 r with both somatotropin and streptomycin. The antibiotic was added to control the infective phase. However, the mortality of the treated group was not less than that of the control mice. On the other hand Lacassagne and co-workers reported that somatotropin injected daily in large doses for six days preceding or following whole body x-irradiation (150 r for guinea pigs and 250, 300, 500, or 900 r for rats) decreased the radiosensitivity of these animals. The authors decided to investigate the effect of somatotropic hormone following whole body irradiation on larger animals with an $L.D._{50}$ comparable to that of man. Twenty young Yorkshire swine weighing from 30 to 40 lb. each were used. The animals were divided into two groups of 10 and were paired according to weight and sex. The swine were exposed one at a time to 600 r, the dose being divided so that each lateral aspect of the animals received 300 r. The 10 swine in the treated group were injected 24 hours after irradiation with 100 mg. of somatotropic hormone in physiological sodium chloride solution intramuscularly, while the control group received a similar amount of sodium chloride solution. The injections were continued until death or the end of the 30-day period of observation. It was found that administration of somatotropin after exposure of swine to a sufficient amount of x-irradiation to cause a mortality of 80% increased the mortality rate to 100%. Moreover, the treated animals died sooner and lost weight more rapidly than the controls. The pathological findings were essentially the same in both groups.

ANESTHESIA

Anesthesia for Children Undergoing Diagnostic Cardiac Catheterization. E. J. Fieldman, J. S. Lundy, J. W. DuShane and E. H. Wood. Anesthesiology **16**:868-875 (Nov.) 1955 [Philadelphia].

The authors present methods of inducing and maintaining anesthesia in 104 children undergoing diagnostic cardiac catheterization at the Mayo Clinic. Many other children were catheterized with the use of sedation alone. The youngest child to undergo catheterization was 6 weeks old, while the mean age was 4.7 years. The child is admitted the evening prior to the procedure and is evaluated by the pediatrician and the anesthesiologist. Bedtime sedation consisting of 0.75 grains (about 0.05 gm.) of pentobarbital sodium (Nembutal sodium) is given along with other drugs such as digitalis and antibiotics, when indicated. No food is permitted after midnight. In the morning, about one and a half hours prior to the catheterization, the patient is given a warm-water enema. This is followed in turn by 0.75 grains of pentobarbital sodium administered rectally and by moderately heavy premedication that consisted of 0.042 grains (about 2.7 mg.) of morphine sulfate administered subcutaneously. The patient then is brought to the catheterization room and anesthetized with rectally administered tribromoethanol solution (Avertin), 2.5%, or thiopental sodium (Pentothal sodium), 10%. When adequate premedication has been given, a dose of 100 mg. of tribromoethanol solution per kilogram of body weight is most satisfactory. With the child asleep, venipuncture is done and a syringe containing diluted thiopental sodium (1.25%) and a syringe containing sodium chloride solution are connected to the indwelling intravenous needle via a three-way stopcock or Y connection for use should supplementary anesthesia become necessary as the effect of the tribromoethanol solution begins to wear off. Since venipuncture is done when the effect of the tribromoethanol solution is maximal, it is necessary to test the position and the patency of the needle with saline solution, since the use of even small amounts of thiopental sodium at this time may produce and, in fact, has produced respiratory arrest. Injection of supplementary thiopental sodium through an intravenous needle has been found superior to injection of supplementary thiopental sodium through the cardiac catheter. Hot towels were employed to make accessible veins more easily visualized. The patient is placed on the fluoroscopic table, and earpiece oximeters and electrocardiographic leads are connected. Local anesthesia (1% procaine hydrochloride) is used at the site of insertion of the cardiac catheter into an antecubital vein or the saphenous vein below the groin. Endotracheal intubation of these children is not done routinely, but emergency equipment, consisting of oxygen, laryngoscopes, endotracheal tubes, and suction apparatus, should always be easily accessible. Blood pressure and oxygen saturation recordings from the different chambers of the heart, along with arterial dye-dilution curves, are made by means of a photo-oscillographic assembly with the patient breathing either room air or 100% oxygen. The need for vigilant postprocedure care is emphasized. The use of adequate premedication, followed by rectal administration of tribromoethanol solution and supplementary small intravenous doses of thiopental sodium, when required, has been satisfactory.

Cardiac Arrhythmia: Effect of Vagal Stimulation and Hypoxia. J. Jacoby, C. Ziegler, W. Hamelberg and others. Anesthesiology **16**:1004-1008 (Nov.) 1955 [Philadelphia].

Stimulation of the larynx and trachea by endotracheal intubation was considered to be a frequent cause of arrhythmias. Patients who were good surgical risks were selected for the study of this problem. The usual moderate premedication was used: Demerol 75 to 100 mg., and atropine or scopolamine, 0.3 to 0.4 mg. Induction of anesthesia was accomplished with Pentothal and relaxation was obtained with d-tubocurarine. The patient's chest was then repeatedly inflated with oxygen by manual pressure on the breathing bag. Most of the intubations were done by new members of the department. As was expected, because the intubations were not done by experts, hypoxia developed in some cases. After considerable experience had been gained with the combined use of the oximeter and the electrocardiograph, good risk patients were selected in whom anoxia was created by the inhalation of high concentrations of nitrous oxide and low concentrations of oxygen. The limits of safety were not exceeded. The patient was very closely observed by members of the senior staff. Apnea was not produced in any patient. The periods of hypoxia were brief, never exceeding three minutes. The oxygen saturation was not allowed to decrease below 50%; and the degree of hypoxia was less than that which sometimes occurs during intubation by beginners. A total of 121 patients were included in this study. Group 1 consisted of 110 patients intubated by beginners. Group 2 consisted of 11 patients who inhaled 5 to 10% oxygen with nitrous oxide until the blood oxygen saturation fell to between 50 and 60%. These patients were then intubated before air breathing could again elevate the oxygen saturation. Blood oxygen saturation was continuously observed. Electrocardiographic tracings were taken prior to, during, and after intubation. It was found that vagal stimulation was initiated by tracheal intubation and that hypoxia occurred frequently when intubation was performed by beginners. Hypoxia was also produced in patients who were good surgical risks by mixtures low in oxygen. Intubation produced arrhythmias in 9% of well-oxygenated patients and in 36% of the most hypoxic patients. Alterations of pulse rate occurred in 47% of the former and in 91% of the latter. Cardiac responses to vagal stimulation are more frequent and more serious when hypoxia is present.

Adhesive Arachnoiditis and Vascular Blockage Caused by Detergents and Other Chemical Irritants: An Experimental Study. E. W. Hurst. J. Path. & Bact. **70**:167-178 (July) 1955 [Edinburgh, Scotland].

Derangements of nervous function, sometimes taking the form of severe paraplegia and sensory loss that may end fatally, have been recognized as a sequel of spinal anesthesia for more than 35 years. They antedate the development of modern detergents. Some of the cases occur at an interval of days or weeks after the operation, when the patient has perhaps left the care of the surgeon and does not relate his new tribulation to the anesthetic. Whereas up to about 1950 the anesthetic itself was generally incriminated as the causal agent, recently, detergents contaminating the material injected have been blamed for the ensuing neuropathy. The author traces the effects of introducing into the cerebrospinal fluid a variety of substances of very diverse chemical composition. The substances investigated included: several quaternary ammonium compounds, an anionic detergent, a nonionic detergent, the recently introduced antiseptic 1:6-Di-4'-chlorophenyldiguanidohexane, a commercial antiseptic containing chloroxylenol and terpineol, phenol, and horse serum. It was found that a number of substances of quite dissimilar chemical type are capable of: (1) damaging superficial nervous structures exposed to their action, (2) exciting lively cellular proliferation and fibrosis in the pia-arachnoid, with consequent obstruction to the flow of cerebrospinal fluid, and (3) causing necrosis of the media and often of the adventitia of the meningeal arteries, which later respond in a variety of ways tending to obstruct the lumen and restrict the blood supply to the nervous tissue. Although the pathological process begins immediately after introduction of the irritant and proceeds steadily, the early stages may be almost or wholly asymptomatic, and the clinical picture is then one of severe and progressive nervous signs and symptoms arising after a latent period. Although under experimental conditions certain commonly used detergents may evoke these changes, the evidence incriminating them as one of the causes of complications of spinal anesthesia in man is still inadequate; an experimental reappraisal of the toxicity of the anesthetic agents themselves is an urgent necessity.

Ultrashort Anesthesia with Baytinal. A. Westerborn and K. Stenberg. Nord. med. **54**:1589-1592 (Oct. 20) 1955 (In Swedish) [Stockholm, Sweden].

The new short-acting baytinal is considered an excellent agent for minor surgical interventions of brief duration. It is particularly suited for intubations of short duration, reduction of fractures, arteriography, brief anorectal interventions, brisement forcé, incision of abscesses, and the like. In their use of baytinal in about 150 cases, the authors found that it affords pleasant induction of anesthesia, good muscular relaxation, and short postoperative sleep. The complications following its use are few.

BOOK REVIEWS

The Pediatric Years: A Guide in Pediatrics for Workers in Health, Education and Welfare. By Louis Spekter, B.S., M.P.H., M.D., Director, Bureau of Maternal and Child Hygiene, Connecticut State Department of Health. Hartford. Cloth. $12.50. Pp. 734, with 20 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1955.

Associated with physicians in caring for the health of children is a large group of professional workers who have had little or no formal training in pediatrics—social workers, physical and occupational therapists, nutritionists, dentists, psychologists, health educators, school supervisors, hospital administrators, sanitary engineers, teachers of the handicapped, camp directors, administrators of health programs, laboratory and x-ray technicians, and medical secretaries. It was to help these persons to understand not only the sick and crippled child but also the well child that this book was written. The author is a pediatrician and a public health physician who has spent over 15 years in the Connecticut State Department of Health.

The first two sections of the book deal with normal growth and development, the care of the premature and full-term baby, the examination of the sick and the healthy child, nutrition, and adolescence. Section 3 discusses the various abnormalities and diseases found in children. Section 4 lists the different voluntary and governmental health services in this country and describes the work that each one is doing. Section 5 lists those standards that now prevail in various types of institutions for children (i. e., foster homes, hospitals for the care of the acutely ill and the convalescent child, child care centers, and regular and special camps). The last section presents a brief description of the more common laboratory procedures and a glossary of the medical terms used in the text.

The author has a readable style, and he is to be congratulated on being able to put so much information between the covers of a single volume. This he has accomplished by removing all verbiage, a talent possessed by few medical writers today. His method of discussing the various diseases is especially commendable. After a brief but composite description of the cause, symptoms, and general picture of a disease, he outlines the treatment in broad terms, carefully avoiding specific suggestions or instructions that might tempt the reader to play the role of physician. It is surprising that a book of this type has not been published before this, for it fills a great need. It should provide an insight into the problems of pediatrics not obtainable otherwise except by searching through many volumes and periodicals and be of great help to the personnel in the offices of the pediatrician, general practitioner, and health officer. These persons may have some general knowledge, but here they will find that specific information that they need if they are to be better qualified for their work.

New Concepts in Surgery of the Vascular System. By Emile Holman, M.D., Professor of Surgery, Stanford University School of Medicine, San Francisco. A. The Immediate and Late Treatment of Arterial Injuries. Presented as David W. Yandell lecture before Louisville Surgical Society, Louisville, Kentucky. B. The Pathologic Physiology of Poststenotic Dilatation: Its Significance in the Development of Arterial Aneurysms. Presented as Arthur Dean Bevan lecture before Chicago Surgical Society, Chicago, Illinois. Publication number 271, American Lecture Series, monograph in American Lectures in Surgery. Edited by Michael E. De Bakey, M.D., Professor of Surgery and Chairman of Department of Surgery, Baylor University College of Medicine, Houston, Texas, and R. Glen Spurling, M.D., Clinical Professor of Surgery, University of Louisville, Louisville, Kentucky. Cloth. $3.50. Pp. 108, with 47 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1955.

In this monograph the recent developments in the treatment of arterial injuries are reviewed and some experimental observations by the author are described. The first part is devoted to the immediate and late treatment of arterial injuries. Formerly, the dangers of thrombosis, sepsis, and secondary hemorrhage accompanying immediate repair were emphasized, but it is now recognized that continuity of the injured artery must be restored if gangrene is to be avoided. The remarkable results achieved in the treatment of arterial wounds in the Korean war are compared with those obtained in World War II, and the author lists some important factors contributing to this improvement. Some of these are: (1) the ready availability of antibiotics; (2) the development of special instruments and devices to control bleeding without injury to the wall of the blood vessel, and the availability of fine sutures and needles; (3) the availability of blood and plasma expanders in unlimited quantities; (4) the improvement in the mechanics of transportation; and (5) the development of methods of preserving segments of blood vessels.

The basic principles of management of the acute arterial wound are reviewed. These include control of the artery above and below the site of injury, control of vasospasm in the proximal segment, careful débridement of the traumatized vessel itself, and the performance of a careful anastomosis. In describing the technique of arterial anastomosis, the author expresses a preference for the use of simple interrupted sutures to avoid the production of stenosis. Surgical approaches to the major arteries are outlined. The necessity for maintaining blood pressure at a normal or slightly higher level by repeated transfusions is emphasized. Some of the physiological alterations resulting from the development of arteriovenous fistulas are described, and the importance of avoiding these late changes by early closure of the fistula and restoration of arterial continuity is stressed.

The second part of the monograph is concerned with the significance of segmental stenosis and poststenotic dilatation in the development of arterial aneurysms and the biological importance of structural fatigue. In an attempt to explain the apparently paradoxical development of dilatation distal to partial constriction of an artery, some interesting experiments were performed. First, poststenotic dilatation was produced in puppies almost at will and within a relatively short time by placing about the thoracic aorta a simple ligature that did not immediately constrict it but limited its diameter as the puppy grew to maturity. Second, in the presence of this experimental poststenotic dilatation, it was found that increasing the blood pressure by the injection of epinephrine produced expansion of the dilated segment out of proportion to that of the proximal aorta, and, when the effects of the epinephrine had subsided and the blood pressure had returned to normal levels, the poststenotic dilatation diminished in size. Experiments were also conducted with an artificial circulatory system. Stenosis was produced in a piece of elastic rubber tubing, and, after 21 hours of continuous pumping, dilatation beyond the constriction appeared. From these experimental observations it was concluded that poststenotic dilatation results from the operation of certain hydrodynamic principles governing the pulsating flow of blood through an expanse of elastic tube. The factors involved are a greater lateral pressure on the walls of the vessel distal to the constriction, a greater widening of the stream diameter, and a lessened velocity of flow. Finally, in an attempt to explain the development of aneurysms, it is suggested that the site of development of aneurysmal dilatation is immediately preceded by an area of inelasticity of the vessel wall or of narrowing of the lumen. These factors result in a greater stress on the arterial wall distal to the area of rigidity or partial obstruction so that dilatation occurs. Although dilatation occurs slowly at first, structural fatigue ultimately develops and rapid dilatation of the artery takes place. This is a well-written and effectively illustrated monograph that will be of particular value to those interested in vascular surgery.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

QUERIES AND MINOR NOTES

ANESTHESIA FOR SHORT OPERATIONS

TO THE EDITOR:—*What are the relative merits of thiopental (Pentothal) intravenously and inhalation of nitrous oxide for anesthesia for minor procedures, particularly the reduction of fractures and dilatation and curettage? What are the potential hazards of the two and particular desirability for use by non-specialty-trained physicians?* *M.D., Texas.*

ANSWER.—The combination of intravenously given thiopental and inhalation of nitrous oxide usually provides satisfactory anesthesia for such procedures as reduction of fractures and dilatation and curettage. Intravenously given thiopental provides a pleasant induction of anesthesia. Smooth anesthesia may be maintained by intermittent injections of small amounts of 2.5% thiopental and continuous inhalation of a mixture of 70 to 80% nitrous oxide and 30 to 20% oxygen. The recovery period is short and usually is free of nausea and vomiting. The hazards of this technique include all the dangers associated with the use of each individual drug in the combination. Thiopental depresses the respiratory center, and an excessive dose may result in apnea. There is usually a small reduction of the blood pressure in normal patients who receive thiopental. This may be greatly exaggerated in patients with organic heart disease or a depleted blood volume. The laryngeal reflex remains intact and is perhaps unusually sensitive during thiopental hypnosis. A small amount of mucus or blood entering the larynx, a rubber airway contacting the epiglottis, or a painful peripheral stimuli may provoke an intense laryngospasm. The greatest danger associated with the use of nitrous oxide is anoxic anoxia. This may be eliminated by providing at least 20% oxygen and a total flow rate of 4 to 6 liters per minute. When these points are carefully considered, the combined use of these two agents provides an excellent means of providing anesthesia for short surgical procedures requiring little relaxation.

TREATMENT OF TYPHOID CARRIER

TO THE EDITOR:—*How should a carrier of Salmonella typhimurium be treated? The patient is asymptomatic 35 days after a severe outbreak of food poisoning. His sister was quite sick and his wife died of the infection. At present, there is no diarrhea. He has a temperature of 99.4 F (37.5 C). One week of treatment with chloromycetin, 1 gm. a day, did not eliminate the germ. He works in a brewery, handling the filler machine. He does not touch the beer or the bottles. Should he be allowed to work?*

Charles A. Kemper, M.D., Chippewa Falls, Wis.

ANSWER.—It is not uncommon for Salmonella organisms to remain in the stool for one to four months after an acute infection, then disappear without further treatment. The low grade fever described in the patient suggests that he may be having a continuing infection and may not be a "healthy carrier." The first step in further treatment should be sensitivity tests, using all of the antibiotics effective against the micro-organism in question. If chloromycetin proves to be the most effective antibiotic, another vigorous course of therapy with this drug should be tried, first starting with a dose of 750 mg. every 6 hours for 48 hours, then reducing the dose to 500 mg. every 6 hours, and continuing this regimen for at least 10 days. The danger of interference with hematopoiesis is probably little greater from such a course of therapy than from the week of administration of 1 gm. daily, which has already been given. If some other antibiotic, particularly one of the tetracyclines, is found to be more effective than chloromycetin, it should be used for 10 days or longer (depending on the response) in similar full dosage. If the Salmonella organisms were found not to be highly sensitive to any antibiotic, this consultant would be inclined to administer Neomycin in doses of 1 gm. every six hours for five to seven days as a trial. Beeson has advised the parenteral use of penicillin in doses of 10,000,000 units per 24 hours for 6 to 10 days in persistent typhoid carriers whose cases did not clear up on treatment with chloromycetin. Since frequently the gallbladder is the focus in which Salmonella organisms persist, cholecystectomy has been advised in persons who continue to be carriers over periods of many months or a year. The advisability of allowing the patient to remain on a job in which he might contaminate beer is questionable. It would appear from the facts given that situations might arise in which such contamination was possible. The persistent elevated temperature would seem to be a good reason for taking him off the job, in addition to the carrier state for Salmonella organisms.

TREATMENT OF PATIENT HAVING TAPEWORM

TO THE EDITOR:—*Having been unsuccessful in ridding a young man, symptom-free, of a beef tapeworm (Taenia saginata) after two courses of male fern (Aspidium) and one of Atabrine at two monthly intervals, I would appreciate any suggestions you may have.*

Gottlieb Helpern, M.D., New York.

ANSWER.—Many anthelmintics have been used in the treatment of infection with Taenia saginata. Recent clinical studies show that quinacrine hydrochloride (Atabrine) is the most effective and least toxic drug. The chief reasons for failure to eradicate the worm, that is, failure to obtain the head are: (1) inadequate preparation of the patient, with the intestine not sufficiently emptied before the anthelmintic is given; (2) drug not potent or fresh, especially when oleoresin of Aspidium is used; and (3) failure to obtain the intelligent cooperation of the patient. Steps in treatment with quinacrine hydrochloride include: 1. Two days before treatment the patient is placed on a light, residue-free diet. 2. The night before treatment a saline purge with sodium sulfate (Glauber's salt), 1 tablespoon dissolved in a glass full of water, is given. 3. On the day of treatment the patient is kept in bed and receives no breakfast except plain tea or black coffee. Phenobarbital, 0.03 gm., is given one hour before medication. 4. One hour later the patient is given 0.2 gm. of quinacrine hydrochloride every 10 minutes for four or five doses, total dose 0.8 to 1.0 gm. depending on the weight of patient. Sodium bicarbonate, 0.6 gm., is given with each dose of quinacrine to allay nausea. 5. Two hours after the last dose of quinacrine the saline purge is repeated. 6. All stools are saved. It is best to collect them in a commode filled with warm sodium chloride solution. In this way the worm passes from the body to the saline solution without contact with air. The cooling and drying effect of the air may cause the worm to break in the region of the slender neck. If the head is retained it will grow to maturity in two or three months and the patient will start to pass segments and ova again. 7. All stools are examined. Usually the entire worm, measuring 5 to 25 m., is passed at one time, stained deep yellow by the medication. The full length of the worm is observed. As the head is approached the worm becomes narrower and narrower until it is thread-like in the neck region. The head is wider than the neck, is rhomboidal in shape, and usually is black. 8. The patient may take food after a copious bowel movement results from the second purge. If these directions are followed carefully the rate of cure is high. Infection with T. saginata is most often single, but it may be multiple. With this tapeworm man is always the definitive host, that is, the adult worm is found in the intestinal tract of man; proglottis and ova are passed in his stool. The larval stage does not occur in man. Infection with T. solium is much more serious, for with

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this worm man may be both definitive and intermediate host. Reinfection should be avoided by: (1) sanitary disposal of human excreta to prevent infection of cattle, (2) keeping beef in the deep freeze 24 hours or longer to kill the larvae of T. saginata, and (3) heating beef to 65 C throughout the entire meat mass to kill the cysticerci, as the thermal death point of the cysts embedded in the beef muscle is 56 C.

LIVER FUNCTION TESTS

TO THE EDITOR:—*My problem is the interpretation of the following liver function tests: sulfobromophthalein, cephalin flocculation, thymol turbidity, serum bilirubin (indirect and direct), alkaline phosphatase, cholesterol and cholesterol esters, prothrombin, and albumin and globulin (total and ratio). I am interested in learning whether correlation studies have been performed between liver biopsy and the above tests. Is it possible for the liver biopsy to be normal in the majority of cases following hepatitis and still have some of the above tests abnormal? What criteria can I employ in determining the significance of the abnormality of these tests when the patient clinically is otherwise well? How long may these tests remain abnormal and still not indicate active liver disease?*

M.D., Florida.

ANSWER.—Many of the so-called liver function tests measure "function" of the liver only indirectly; many are empirical, the exact basis for their relation to disease of the liver being unknown; most are nonspecific, being frequently positive in disease of tissues other than the liver, and the majority are insufficiently sensitive, liver disease sometimes being present with a normal test. For these reasons the tests specifically inquired about must be interpreted with great care and can be used only as aids supporting (or the contrary) a diagnosis made on careful clinical grounds. A diagnosis of the liver disease or of its absence, or of the kind of liver disease, can rarely be made by any one or group of these tests. Nevertheless, the tests are of great value when their usefulness and limitations are known. Studies correlating these tests with liver biopsy, and at times autopsy, have been made a number of times (Berk, J. E., and Shay, H.: Liver Biopsy and Liver Function Tests: Complementary Roles in Diagnosis of Liver Disease, *J. A. M. A.* **148:**109 [Jan. 12] 1952; Christian, E. R.: An Evaluation of Needle Biopsy of the Liver, *Am. J. Med.* **13:**689 [Dec.] 1952; and Schneider, E. M.; Berman, J. R.; Gall, E. A., and Schiff, L.: Needle Biopsy of the Liver: IV. Relationship of Clinical and Laboratory Findings to Histologic Structure in 100 Cases of Portal Cirrhosis, *ibid.* **15:**207 [Aug.] 1953). The reader should note the frequency with which the correlation is inaccurate as well as the other limitations of the test pointed out in these articles. Following viral hepatitis, the liver biopsy may return to normal and yet disturbances in some of these tests may remain. Rarely will the sulfobromophthalein, serum bilirubin, or alkaline phosphatase levels be elevated in this circumstance. The cephalin flocculation level usually returns to normal soon after the patient is clinically well but sometimes remains for some weeks or months. The thymol turbidity may remain abnormal in exceptional cases for as long as a year or more after an acute episode. Likewise, the serum globulin level may sometimes be elevated for prolonged periods of time, although the albumin level usually returns to normal relatively rapidly. The cholesterol and cholesterol esters and prothrombin concentration may be little disturbed in viral hepatitis and usually return to normal as the disease becomes clinically no longer evident. When a patient is clinically well, abnormalities of one or more of these tests must be evaluated individually, particularly with respect to the tests. Thus, an elevated serum bilirubin level simply means that bile pigment is present in the blood in greater than normal amounts. This, of course, may not only be due to hepatic disease but also to extrahepatic obstruction, to hemolytic anemia, and to these uncommon chronic mild bilirubinemias of unknown etiology. The sulfobromophthalein may be abnormal in the absence of liver disease, in congestive cardiac failure, in other disturbances of hepatic circulation without liver disease, and sometimes in febrile disturbances especially due to the pneumococcus. The alkaline phosphatase level is frequently abnormal in certain diseases of bone. Blood cholesterol level and cholesterol esters may be abnormal in diseases of lipid metabolism, in extrahepatic biliary obstruction, and in some other conditions. The blood prothrombin concentration is a reflection not only of the liver's ability to make prothrombin from vitamin K and other precursors but likewise reflects deficiencies of vitamin K and the use of the substances of the coumarin series. The albumin and globulin concentrations and the cephalin flocculation and thymol turbidity tests depend largely on the relative concentrations of the serum proteins. It is well known that the serum proteins are often disturbed in disease processes, and, hence, it is not surprising to find that these tests may be abnormal in a variety of disease states. The cephalin flocculation is perhaps the most specific of these tests, but even here there may be positive results in other diseases, particularly those in which there is a high globulin concentration. The tests inquired about have been used for many years in the study of hepatic and other disease and a good deal is known about their relationships to various disease processes. Many patients with chronic stabilized cirrhosis, for example, may have a normal cephalin flocculation test, thymol turbidity test, serum bilirubin level, alkaline phosphatase level, cholesterol level and cholesterol esters, and prothrombin time. There will usually be some reduction in albumin and some alteration in globulin content, and in most, but not all, the sulfobromophthalein is abnormally retained. The cause of the persistent abnormalities in some of the tests, e. g., thymol turbidity after a patient with hepatitis is apparently clinically well, is not known. The terminology "physiological scar" may be a helpful analogy but is probably not strictly accurate.

MASTURBATION

TO THE EDITOR:—*What would be the treatment of a case of masturbation in a baby 18 months old? The child is well developed and well nourished. She does not touch her genitalia with her hands, using mostly the leg of the table three and four times a day. Urinalysis and stool analysis have been negative.*

M.D., Illinois.

ANSWER.—Masturbation by infants is common, probably universal, and may be considered normal and physiological for their psychosexual development. Many use manual manipulation as soon as their dexterity matures sufficiently for voluntary activity, as early as age 6 months. Others learn masturbation by chance, like crossing the legs and squeezing the thighs together, embracing a blanket between the legs, or rubbing against an object, as a leg of a table as in this case. Some children masturbate less obviously, and parents are unaware of the practice. Others use related activities for gratification, such as thumb or finger-sucking, tongue-sucking, rocking, or head-banging. The child usually masturbates before falling asleep; when lonesome, upset, or anxious; or when excited while watching television or listening to the radio. No physical or psychic ill-effects can be attributed to masturbation directly, nor does it indicate any perverse or psychopathological trends. Excessive masturbation may cause secondary local irritation. Compulsive, repetitive masturbation, with the more or less exclusion of other normal activities, indicates psychological frustration. Ordinarily masturbation needs no special treatment and should be merely disregarded by parents so as not to focus undue attention or cause unnecessary guilt reactions. Excessive masturbation may be symptomatic and indicates that the child is unhappy and needs special attention. The birth of a sibling may precipitate it. The mother should pick up the child more frequently, hold her for a few minutes, talk to her, caress her, give her a toy, or stay with her until she falls asleep. Some children are overstimulated sexually by overfastidious cleansing of the genitals or by undue exposure to the nudity of the parents. Most children gradually discontinue these direct forms of physiological gratification, stopping at about age 6 years, and replace them by more advanced, indirect, socialized gratifications or sublimations.

POLIOMYELITIS AMONG PREGNANT WOMEN

TO THE EDITOR:—*I have not seen an authoritative statement in medical literature relative to the desirability of administering Salk poliomyelitis vaccine to pregnant women. Nevertheless, all news accounts prominently mention pregnant women as a high priority group for Salk Vaccine. I have been told that pregnant women are 12 times as susceptible to poliomyelitis as nonpregnant women. This does not agree with my personal experience and certainly does not agree with the article by Dr. Paula Horn in the August, 1955, issue of* Obstetrics and Gynecology, *reporting 20 years' experience in San Francisco County. As I have been unable to get any further information from our local or state boards of health as to the basis for or the desirability of vaccinating all pregnant women, I would be most grateful if you could help solve this problem.*

Frederick S. Taber, M.D., New Brunswick, N. J.

ANSWER.—Epidemiological studies indicate that the attack rates of poliomyelitis are significantly higher among pregnant women than among other women or men of similar age. These higher rates persist when account is taken of other factors known to influence the incidence of the disease. Such other factors include previous tonsillectomy, intramuscular or subcutaneous inoculation of antigens, and exposure to poliomyelitis cases or children, who are especially prone to spread the disease. This is strong presumptive evidence that pregnancy enhances susceptibility to poliomyelitis. Pregnancy has been described as a condition that increases the risk of poliomyelitis by a factor of two or more. Its apparent effect and its quantitative importance during an outbreak will vary with (1) level of susceptibility to poliomyelitis among women of reproductive age, (2) virulence of the infectious agent, and (3) other factors of host and parasite. The mechanism of the increased risk presumably relates to endocrinological factors that alter defense mechanisms at sites of virus multiplication or invasion. Poliomyelitis case fatality rates and frequencies of bulbar forms in pregnant and nonpregnant women are usually similar when one considers the total gestation period. However, women who contract poliomyelitis in the third trimester of pregnancy are more apt to have a bulbar form and to die than women in the first and second trimester, or women of comparable age who are nongravid. Adequate evidence exists to indicate that immunization of children, aged 6 to 9 years, with Salk poliomyelitis vaccine reduces the incidence of this disease. It is reasonable to expect that such immunization of pregnant women would likewise reduce incidence without adverse effect to expectant mother or fetus. Since high poliomyelitis incidence frequently prevails in childbearing years during epidemics, and since increased risk accompanies pregnancy, immunization of all women in this age class is desirable. Currently, however, limited supplies of vaccine in many immunization programs restrict its use among adults to pregnant women.

PERICARDIAL LYMPHATICS

TO THE EDITOR:—*What is the caliber of the pericardial lymphatic capillaries in Yorkshire piglets, in the dog, and in the human being?* *Aaron N. Garelik, M.D., Columbus, Ohio.*

ANSWER.—This matter was discussed with a professor of anatomy and with other members of a department of anatomy. In dissection, lymphatics are usually collapsed, so that little idea can be had of their potential size when fully distended. This depends on the rate of drainage. Sometimes the lymphatics can be greatly distended, as after a full fat meal. The pericardial lymph vessels vary in caliber depending on circumstances. Usually the young, growing mammal has seemingly small lymphatics, but they are greatly distensible. In the piglet they may be apparently 1 mm. in diameter when collapsed and may vary to twice that caliber when distended. This same observation holds for the dog. Depending on age and size, the pericardial lymphatics may vary from 1 to 3 mm. in caliber, and in some old dogs they may even seem to be larger. Thus it is with human beings. The caliber will vary greatly with age, weight, state of nutrition, and general health status. In some specimens at dissection it may be impossible to find or to trace the pericardial lymphatics in a satisfactory manner. On injection with mercury, they may seem to be quite distended, and their caliber may be about 1 or 2 mm.

UNCONTROLLABLE OUTBURSTS

TO THE EDITOR:—*A number of persons, mostly males, suffer from uncontrollable outbursts of rage. They build up a terrific tension as they try to hold in the outburst, then, in order to explode, take to alcohol and, following it, feel relief. The cycle then starts once again. This is not psychomotor epilepsy, although there may be disturbed manifestations in the electroencephalogram. The reaction is more akin to that in experimental animals when parts of the brain are destroyed and inhibiting influences removed. Their background will often reveal an early life disturbance in their relationships with their parents, with repression of anger. However, there seems to be a biological component. If so, what is its basis? And what is the possible management?*

Edward Dengrove, M.D., Asbury Park, N. J.

ANSWER.—The above syndrome would appear to be chronic encephalitis. The encephalitis could well have had its origin in a childhood illness such as measles. On the other hand, there are many other etiological agents, such as malaria, typhus, psittacosis, brucellosis, and even sunstroke (McCartney, J. L.: Tropical Neuropsychiatry, *War Med.* **3**:351 [April] 1943; and Tropical Encephalopathy: Malaria and Solar Etiology, *New York J. Med.* **46**:1348 [June 15] 1946). Encephalitis was not an uncommon diagnosis amongst the servicemen who were sent to the tropics. These individuals are hypersensitive to alcohol and have a great deal of difficulty keeping their emotions under control. Psychotherapy is of value in helping the individual understand his margin of safety and the necessity of avoiding cerebral stimulants. The new drugs such as reserpine and chlorpromazine are helpful in reducing hypersensitivity, although they are not cures in themselves.

INTESTINAL DIVERTICULA

TO THE EDITOR:—*A patient with diverticula of the jejunum and duodenum has excessive flatulence, periodic abdominal cramps, nervousness, and irritability. What treatment can you suggest for these conditions?*

W. C. Behen, M.D., Lansing, Mich.

ANSWER.—Diverticula of the duodenum and jejunum rarely cause symptoms. They are not an uncommon finding, particularly in the older age group of individuals. But even when they occur in younger people, they are rarely associated with symptoms of any particular type. Individuals who have them may have excessive flatulence and abdominal cramps, but, generally speaking, such symptoms are more a part of the irritable intestine or digestive tract syndrome than a result of the presence of diverticula. Symptomatic measures required for the relief of flatulence, abdominal cramps, nervousness, and irritability would be indicated in such a case. Use of powdered charcoal is sometimes helpful in these cases. But the relief of nervous tension is probably of paramount importance.

RELIEF OF PRURITUS

TO THE EDITOR:—*A 64-year-old white man, with chronic myelogenous leukemia, complains of generalized itching, preceded by a warmth and pinching, needle-like sensation. These attacks last about two hours almost every day and leave him completely exhausted. He has not responded to any of the six mercaptopurine drugs. He has had three episodes of gastrointestinal hemorrhage in the last four years. Is there any therapy to offer him for relief of such annoying symptoms?* *Orfeo Brucato, M.D., Yonkers, N. Y.*

ANSWER.—Since corticosteroids cannot be used because of the three episodes of gastrointestinal hemorrhage, one must try one method after another. Pronestyl, by mouth or intravenously if necessary, should be tried. If there is a likelihood that the pruritus has an hepatic origin, treatment with methyltestosterone might be employed. Often strontium bromide intravenously affords relief; and topical agents such as colloid baths and antipruritic lotions should be used to complement the systemic therapy.